

REPORT

OF THE

PILGRIM COMMITTEE

BIHAR AND ORISSA

1913



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Report of the Pilgrim Committee, Bihar and Orissa.

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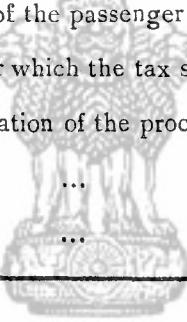
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 सन्यमेव जयते

Report of the Pilgrim Committee, Bihar and Orissa.

PART—I.

PLACES OF PILGRIMAGE.

A—INTRODUCTORY.

1. This Committee was appointed at the suggestion of the Government of India, (*vide* their letter No. 1578-1588, dated

Institution and scope of the inquiry.

24th August 1912, Appendix I) to consider the possibility of improving the sanitary arrangements at centres where Hindu and Muhammadan pilgrims congregate for worship in this province. The scope of the inquiry was to be as wide as possible and to include such questions as lodging-house accommodation, sanitary arrangements on railways, and food and water supplies. The Committee was constituted as follows :—

President.

The Hon'ble Major J. C. Robertson, C.I.E., I.M.S.,

Sanitary Commissioner with the Government of India.

Members.

Lieutenant-Colonel E. C. Hare, I.M.S.,

Sanitary Commissioner, Bihar and Orissa.

J. T. Whitty, Esq., I.C.S., *Magistrate and Collector of Gaya.*

G. W. Disney, Esq., *Sanitary Engineer, Bihar and Orissa.*

K. W. Digby, Esq., *Deputy Manager, Bengal Nagpur Railway.*

P. G. Murray, Esq., *Divisional Superintendent, East Indian Railway.*

Dr. R. H. Pulipaka, *Civil Surgeon, Puri.*

2. Centres of religious pilgrimage may be usefully divided on sanitary grounds into "places of pilgrimage" and

Places of pilgrimage much more important than fairs: enquiry confined to former. "fairs". The line of separation is not a hard and fast one, but it is convenient,

and it is one which, year by year, is becoming

more and more important. By a "place of pilgrimage" is meant a place to which pilgrims resort in considerable numbers throughout the year, a place that has a special religious sanctity of its own, apart from the occurrence of a holy day, and which it is the duty of the pious to visit at least once during their lifetime. These places naturally support a permanent population ; they are almost all Hindu ; all are, and have been for generations, famous throughout India, and some have grown into large and important towns. A "fair" on the other hand is a place where pilgrims congregate in numbers on one or more occasions only during the year : frequently the attractions are secular as well as religious and only in rare instances do people come in numbers from long distances. Such places are, as a rule, but sparsely populated throughout the rest of the year, the only permanent residents being a few faqirs or the people of a small village. It is only at the time of the festivals that they spring into importance and call for regular sanitation.

Generally the number of pilgrims visiting a "place of pilgrimage" is greatly augmented on the festivals that draw the crowds to the "fairs", but the distinguishing characteristic on which we wish to place emphasis is that the places where "fairs" are held are, as a rule, of consequence only to the neighbouring districts, and on a few special days, while the "places of pilgrimage" are visited by devotees from all over India every day throughout the year. From the point of view of public health the latter are by far the more important and at a preliminary meeting of the Committee it was decided that our inquiry should be confined to places of pilgrimage only. To this the Government of Bihar and Orissa agreed.

3. In this province the chief "places of pilgrimage" are Puri, Gaya, Deoghur (Baidyanath), Bhubaneswar and **Procedure.** Satyabadi and we visited each of them

during the rains of 1913 to inquire into the sanitary conditions under which the pilgrims live and travel. Our tour is given in Appendix II. The dates of our visit to each place was intimated to all officials and non-officials likely to be able to assist us in our inquiries and they were invited to meet and accompany us at our inspections. Before starting our tour the institution of the inquiry and its aims were notified in the public press, both English and vernacular, and suggestions and advice were invited from any one interested. At the same time reports, statistics, suggestions and, generally, all relevant information likely to be of use to us was called for from the District Officers and Civil Surgeons concerned. The information received was gone through and discussed before any place was visited. On arrival the place was first thoroughly inspected in company with the officials and others well acquainted with its conditions and requirements. After the inspection evidence was taken from anyone wishing to make suggestions to us and this was discussed in the light of the local knowledge which we had obtained.

B—GENERAL.

4. That large gatherings of pilgrims are responsible for much of the spread of infectious disease in India is usually

Influence of large gatherings in spreading infectious disease. accepted as a matter of common knowledge. On the truth of this belief, however, depends the whole usefulness of our

inquiry and it seemed necessary that, as a preliminary, we should thoroughly test its accuracy. To obtain definite information on the subject and, where possible, specific instances of the occurrence within recent years of the spread of disease from religious festivals and fairs, all the Civil Surgeons in the province were asked for their experience and any records that were available were also carefully examined. The result of these inquiries showed that while the origins of epidemics in this country are seldom fully and definitely worked out, the Civil Surgeons were practically unanimous in holding the gatherings at fairs and places of pilgrimage to be a frequent cause of the spread of infectious disease, and more especially of cholera, and several of them were able to cite definite facts and figures in support of their belief. Much additional corroborative evidence was also afforded by old records and reports.

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The following may be given as definite cases in which epidemics were started by pilgrims. During 1905 two small epidemics of cholera in the Palamau district were traced to pilgrims returning from Gaya and Allahabad : in the same district in 1908 two larger outbreaks of this disease, resulting in 8,321 recorded deaths, were started by pilgrims from Allahabad and Benares, and again in 1913 cholera was introduced by pilgrims also from Benares. During 1912 and 1913 four separate outbreaks of cholera in the Manbhum district were definitely traced to pilgrims returning from festivals at Allahabad, Puri and Anara, and in 1912 a large epidemic in Gaya was started by pilgrims from Barisal. Puri, which has always borne an unenviable notoriety as a cholera centre, is almost every year responsible for the introduction of that disease into the Cuttack and Balasore districts. Pilgrims returning from Puri have also brought cholera to the Central Provinces every year since 1905 and into Allahabad and Ajodhya in 1910 and 1912. In the epidemic of 1912 in the Central Provinces over 34,000 deaths were reported : in 1913 the first cases from Puri were introduced to a fair at Dhamakhera, and thence the disease spread far and wide. In the Central Provinces infection is also frequently introduced from the fairs at Pandharpur, and in 1913 three small epidemics at Akola, Nagpur and Wardah were traced to Benares. Almost every year an outbreak of cholera occurs in the districts bordering on Fyzabad and either originates in, or is intensified by the fairs at Ajodhya. A similar action and reaction is said to occur between the Puri and Gaya districts and their respective headquarter towns and this is borne out by the statistics in Appendices III and IV. Cholera, it will be seen, is rarely absent for a whole month from either of these towns or districts but the figures show that, as a rule, increased prevalence appears first in the two pilgrim towns and

spreads thence to the districts which again later seem to react on the towns. Hardwar was responsible for the introduction of cholera into Meerut and Muzaffarnagar in 1909, into Saharanpur in 1910, into Meerut and Bijnor in 1913 and generally every year into Garhwal. Many cases also of the introduction of cholera into the Punjab by pilgrims from Hardwar in various years have been fully substantiated. In 1906 the Kumbh Magh Mela in Allahabad was responsible for a serious epidemic in Banda, Karwi and Chitrakot, and from the same fair in 1908 cholera was introduced into Mirzapur. Again in 1912 cholera was imported into the Etah district from Soron and in 1910 into the Fatehpur, Rae Bareli and Partabgarh districts from Bindhachal. In 1914 cholera was introduced into Almora by a pilgrim from Gaya. Benares frequently has cases of cholera brought by pilgrims on their way to, or coming from, fairs in other parts of India and similarly small-pox has been traced in the same city from Madras pilgrims. All the epidemics mentioned above are said to have been definitely traced to the sources ascribed to them : the list, however, is by no means an exhaustive one, it merely gives instances from different parts of India which show that the general belief, that the spread of cholera is to a large extent due to places of pilgrimage, rests on a firm basis.

Further, very definite and convincing evidence is given by certain figures collected by Major S. Anderson, I.M.S., and by a statement very kindly compiled for us by the Bengal-Nagpur Railway Administration. In 1902 there was an epidemic of cholera in Puri during the Rath Jatra festival and Major Anderson made inquiries from the Civil Surgeons of the various districts from which pilgrims were known to have come, regarding the total number of cases of cholera which had occurred in their respective districts between July 5th and August 2nd and how many of these cases were amongst returning pilgrims. His figures are given in Appendix V. As Major Anderson remarks, they probably "give but a rough indication of the number of cases caused by pilgrims arriving from Puri, as mainly those who came to the Civil Hospitals for treatment are noted, not counting many who probably died in their houses, beyond the cognisance of the Civil Surgeons or Registrars". They also refer only to the province of Bengal but they suffice to show quite definitely how widespread the infection from an important festival at a place of pilgrimage may be. Of the 16 districts in Bengal, which recorded cases of cholera during those 4 weeks, no less than 12 show infection received from Puri, while of the total number of known cholera cases throughout the whole province during the same period, more than half traced their infection to the same town. Returns from two railways only are given, but in each of the cases of cholera detected the passenger was a pilgrim returning home from Puri. The statement supplied by the Bengal-Nagpur Railway is given in Appendix VI and is equally interesting. An analysis shows that in 1912, when there was again a severe epidemic of cholera at the Rath Jatra Mela, 408 passengers either dead or suffering from cholera were found in trains, or on the railway premises on that line, during the month of July alone. Excluding from this number 116 cases in which the station of origin was not recorded, no less than 251, out of the remaining 292, were pilgrims returning from Puri. The distribution of these cases at the different stations on the railway is shown in Appendix VII. Not only was infection spread by the pilgrims during this month to other parts of the province of Bihar and Orissa, but also to Bengal, to the Central Provinces, and to Central India. Unfortunately it was not possible to get complete returns from the connected railway administrations, and of the contact infections taking place amongst the fellow-passengers in the crowded railway compartments and goods wagons there is no record : the number of such infections, however, must have been very great.

From all the information which has been placed before us it appears that these large religious gatherings are not responsible for the spread of plague. This is what one would expect from the conditions under which the pilgrims generally live : their stay is usually short and most of their time is spent in the open. With reference to cholera the facts are very different. We have had abundant and definite proof that pilgrim centres, though not to the same extent as formerly, are still very frequently foci

of spread of that disease. Small-pox may be similarly spread by pilgrims though in a much less degree. Dysentery and diarrhoea it was impossible to trace, as these diseases are liable to cause sickness rather than death and are everywhere common.

Small-pox, Dysentery and Diarrhoea. At most fairs, however, they are rife and where the festivals continue for some time the out-patient registers of the hospitals show that both diseases tend to become more prevalent. That such gatherings, therefore, do dangerously increase the spread of dysentery and diarrhoea also cannot be doubted.

5. When considering what sanitary arrangements are necessary for these places of pilgrimage it is important that

Advantage of permanent sanitary arrangements. the enormous changes effected by the railways should be borne in mind.

In olden times a pilgrimage meant a difficult and often dangerous journey by road. Before starting, the pilgrim had to arrange all his worldly affairs, for his absence would be long and his return uncertain. In recent years all this has been changed. The pilgrim who now wishes to go to Puri or Gaya can perform practically the whole of his journey by rail and the saving in time, expense and discomfort is incalculable. Enormous numbers now visit these holy places who under former conditions could never have dreamt of doing so.

Another momentous result of this speedy transport by rail is the rapid diffusion of disease. Formerly, when the pilgrims travelled by road in a bullock cart or on foot, the spread of sickness from any centre was slow and gradual. Direct infections, such as those noted between towns so far apart as Puri and Allahabad, or Gaya and Almora, could never have occurred : the journey took so long that the sick fell out by the way. Now the chief centres of pilgrimage are within a few days travel of the farthest parts of India and widespread diffusion similar to that which occurred from Puri in 1912, and is partly shown for one railway and for a limited period only in Appendix VII, may occur at any time.

Another important change brought about by the extension of railways is that, while the total number of pilgrims visiting the holy cities has largely increased, the numbers attending on the chief festival days have not gone up proportionately ; in some cases they appear actually to have diminished. Formerly, when the pilgrimage was a long one, perhaps of several months duration, and was undertaken, if at all, only once in a lifetime, the pilgrims travelled in parties for safety and naturally tried to arrive at their destination in time to participate in the chief festival of the year. Now-a-days a pilgrimage has become much more common, and with the knowledge that the railway is always there and the journey short, the pilgrim has begun to consider what time would be most convenient to himself. At festival times the discomforts and expenses of the journey are apt to be in inverse ratio to the attention the devotee is likely to receive on his arrival at the shrine, and year by year the tendency becomes more marked for the pilgrim to visit the places of pilgrimage at any time throughout the year convenient to himself and not only at the occurrence of the great festivals.

Another important change is the growing tendency for large and sudden inrushes of pilgrims on unexpected days. Formerly a pilgrimage had to be decided on and the preparations made long ahead, but not so now. Most of the pilgrims are agriculturists, and any unusual lull in field work which makes a convenient time for one, probably does so for many, over a wide area. An unexpected rush on some place of pilgrimage is not an unusual result.

All these changes which have been brought about by the railways—the increase in the number of pilgrims, the larger area from which they are drawn, the acceleration of their transport, the more constant stream throughout the year and the liability to unexpected inrushes tend to increase the danger from infection both to, and from, the "place of pilgrimage" and correspondingly make more pressing the need for all the sanitary arrangements being thorough and complete. Fortunately their effect is also to simplify matters somewhat by requiring that these arrangements should, as far as possible, be spread over the whole year. This latter

point seems to have escaped recognition in most of the places of pilgrimage that we visited, the authorities apparently concentrating all their efforts on temporary arrangements against the principal festivals and carrying on the sanitation at other times with a minimum of staff and plant. This policy, we consider, is not only wasteful but dangerous: both as regards staff and appliances, permanent arrangements are cheaper and more efficient, while the risk of infection may be almost as great during the unexpected inrushes as at the chief festivals. The guiding principle, in our opinion, should be to make, at each of these places, all the sanitary arrangements for average festivals permanent so far as possible, the ideal aimed at being that only a minimum of extra temporary staff and plant would be required for the very largest festivals. Wherever too there is a choice of methods, preference should be given to that which is the more elastic and will most readily admit of expansion and contraction to suit the varying needs.

6. As we have seen above, the chief danger to the public health at a "place of pilgrimage" is cholera and next to it probably come dysentery and diarrhoea.

Sanitary requirements. Each of these diseases is spread in a similar way, by close personal contact or by contamination of food or water with the dejecta of a previous patient. A clear and definite indication is thus given of the cardinal requirements in the sanitation of places of pilgrimage, *viz.*, suitable accommodation for the pilgrims, hospital accommodation for the isolation of infectious sick, a pure water-supply, clean and wholesome food, efficient conservancy and good drainage. In most of these requirements the places visited by us were, as a rule, very defective. Gaya alone has a piped water-supply: in all, the accommodation for pilgrims is faulty and the conservancy and drainage more or less rudimentary: in none is there adequate hospital accommodation for infectious diseases or efficient control of the food supply. With regard to these main requirements the details must naturally vary with the local circumstances peculiar to each "place of pilgrimage", but there are several matters of importance which are common to them all. These latter we will consider first and the particular requirements of each individual place later.

C.—ACCOMMODATION FOR PILGRIMS.

7. At the different "places of pilgrimage" pilgrims usually stay either in lodgings-houses, dharamshalas, temples, or

The building and maintenance of dharamshalas. in temporary structures specially erected for them: a certain number also spend the night in the open air, in groves or

other convenient places. During our tour the hardships borne by these houseless pilgrims were frequently brought to our notice and a suggestion was made that the construction of free dharamshalas for their accommodation would be a good and useful work and one which Government should undertake. This suggestion appeared to be based on an assumption that all those pilgrims who sleep out in the open do so only because they are unable to find free accommodation and are too poor to pay for anything else and that, therefore, the hardships entailed on them must be very great. This is not necessarily so. It is at the festivals held at those times of the year when, as a rule, it is no great inconvenience to sleep out, that houseless pilgrims are found in greatest numbers. Many of them too are villagers who make light of sleeping out of doors. For these, except in the event of rain, no special accommodation is necessary and thus far the extent of the evil is exaggerated. At the same time there can be no doubt that the free accommodation at most of the places of pilgrimage is inadequate and at times acutely so. Many people unaccustomed to sleep out of doors are yet too poor to be able to pay the very high charges at the lodgings-houses during the more important festivals and to these the provision of more dharamshalas would prove a real boon. We do not, however, recommend that this work should be undertaken by Government. The laudable tradition of this country has always been to leave this work of charity to private and individual effort. We think that no departure should be made from this excellent custom, but believe that if the need for more dharamshalas at the holy places of pilgrimage were brought prominently to the notice of the many wealthy and pious Hindus of this province, it would be speedily and willingly met.

8. While the work of erecting free dharamshalas should, in our opinion, be left to private charity, Government might most usefully help the poorer pilgrims by

Pilgrim shelters. the erection of shelters the daily charge for which would be fixed and moderate. At ordinary times the rent paid to the lodging-house keepers is small, but at the festivals it is often raised to an exorbitant extent and quite beyond the means of large numbers of the poorer people. The possibility of obtaining simple but clean quarters at a low rent would be a great boon. The chief advantage of such shelters, however, would be in the event of rain. We have already stated that, except for rain, sleeping out in the open is attended with no great hardship to the majority of pilgrims. When rain falls, however, there is extreme discomfort to all; and to the women and children, the old and the weak, the ordeal of passing the night on the wet ground, cold and shivering, and with their clothes soaked with rain, is one which must be attended with serious risk to health. To alleviate the sufferings and discomforts of such people something can and should be done, and we recommend the erection of shelters. The simpler these are the better, so that the cost may be moderate and the rent low. In our opinion long plinths of earth and brick 9 inches high and about 8 feet broad, with a slight slope for drainage and with a ridge pole extending their full length at a height of from 4 to 5 feet, would in most cases meet all requirements. The covering would be provided by the pilgrims themselves by stretching blankets, saris, dhotis, etc., from side to side of the plinth and over the ridge pole; and along each side of the plinth and at its end, rings should be fixed for this purpose. The plinth might be of any length convenient but for the risk of fire: on this account the length should be restricted to from 30 to 40 feet. Where the camping grounds are open and bare, trees should be planted at intervals between the plinths to give shade. Sketches of the form of shelters we suggest are given in Appendices VIII, IX and X. They should be under the control of the local authority and a small charge might be made from each person for occupation from noon of one day till noon of the day following. The charge, which might be remitted in the case of children under 5 years of age, could be most conveniently collected by the sale of tickets coloured differently for each day of the week.

These shelters would, we consider, meet a real need and be very popular. Not only would they ensure to the pilgrim protection from rain and a dry and clean place in which to sleep; they would also, at ordinary times, afford him that degree of separation from the crowd and privacy for himself and family which he so much prizes. From the sanitary point of view they would have a further use also in that, by distributing the crowd more evenly, they would make conservancy and the detection of sickness easier.

9. Of the pilgrims who do not sleep out at night the vast majority are accommodated in licensed lodging-houses while

Licensed lodging-houses, dharamshalas and temples. some stay in dharamshalas or in temples or maths: a few also are put up in the

houses of friends or relatives, but their

number is small and they may be neglected. As a means of accommodation for pilgrims the lodging-houses are by far the most important and they fall into a category by themselves. The dharamshala has been built and is kept as an act of charity by some pious Hindu: it is seldom overcrowded unless at the biggest festivals and its construction is in most cases well suited to the purpose to which it has been devoted. The number residing in the temples and maths is never large, as accommodation is generally given only to disciples or to religious mendicants of particular sects. The licensed lodging-houses on the other hand are kept for profit; they are run on hard business lines; they are meant to pay and to pay well, and this affects every detail of their construction and conduct. The conditions obtaining in the lodging-houses may therefore be considered first.

10. At each "place of pilgrimage" visited during our tour we inspected as many of the licensed lodging-houses as

Licensed lodging-houses--Need of control. possible and saw them both at times of festival, when they were crowded with pilgrims, and also when practically empty.

In them the inmates are constantly changing and with a stream of pilgrims from

every part of India the risk of the introduction and spread of infectious disease is very great. Attention to sanitation should be correspondingly careful, but unfortunately we found that in most cases this was not so. Some of the houses had been specially built to accommodate lodgers but the majority were ordinary private houses and had apparently been selected without regard to their adaptability to the special purpose for which they were to be used. The most elementary sanitary rules were frequently broken: rooms devoid of light and ventilation, over-crowding, disgustingly filthy latrines, often in inner dark closets, unprotected wells close to latrines, cesspools, foul drains, heaps of foetid refuse, in short, every condition likely to spread infection was commonly met with. There were notable exceptions, especially in Puri, Satyabadi and Bhubaneswar, but, as a rule, sanitation was almost wholly neglected and we were very forcibly impressed with the necessity of these houses being more strictly regulated. It is in them that epidemics usually start and from them that they spread: how far reaching this may be in these days of speedy transport is well illustrated by the map, Appendix VII, already referred to.

11. The need for control over lodging-houses is well recognised and the provisions of Bengal Act, IV of 1871, as

Licensed lodging-houses—Present control under Bengal Act IV of 1871. amended by later Acts, have been extended to all the places of pilgrimage in Bihar and Orissa. These give very full

powers and, with the slight modifications which we suggest below, should be quite sufficient to secure all the necessary safeguards. It is in the bye-laws framed under the Act, and in the working of these, and of the provisions of the Act itself, that the chief defects lie. In Puri, Gaya and Deoghur there are also certain sanitary deficiencies, connected with the water supply, conservancy and drainage which are common to each town as a whole, and largely responsible for the present unsatisfactory conditions of the lodging-houses: each of these we will discuss separately under its own heading.

12. At the time of our tour none of the places of pilgrimage had Health Officers and the Health Officers for the

Licensed lodging-houses. Health Officer under the Act. purposes of the Lodging House Act, were in the case of Puri and Gaya the Civil Surgeons of the respective districts, in

Deoghur the Assistant Surgeon in charge of the Civil Dispensary, and for Bhubaneswar and Satyabadi a compounder, who was also Health Officer for the 32 miles of road between these two towns and Puri: the last was a whole-time officer, but to the others were given special allowances for the extra duties entailed. Later in our report we are recommending that 1st grade Health Officers should be appointed for the Puri and Gaya Municipalities, a 2nd grade Health Officer for Deoghur, and a Sub-Assistant Surgeon holding a Sanitary Inspector's certificate, as Health Officer for Bhubaneswar and Satyabadi. Should this recommendation be accepted, prevention of disease, accommodation, water-supply, conservancy, etc., in the lodging-houses will each form an integral part of the similar duty of the new Health Officers in each town as a whole. To prevent an undesirable division of authority and work therefore we would recommend that the latter officers be appointed Health Officers for the purposes of the Lodging House Act also, within their respective areas, and that the appointments and allowances of the existing Health Officers be abolished. No change in the Act would be necessary to give effect to this recommendation.

13. The most suitable time for a general sanitary inspection of a lodging-house is obviously the forenoon when most

Licensed lodging-house. Time of inspection. of the pilgrims are out performing their religious duties and the premises should have been cleaned up for the day. An

inspection at this time, however, would be of little use in detecting infringements of the rules regarding overcrowding. Visits with this object are usually made late in the evening, as this is the only time when the inspecting officer can be sure of finding all the pilgrims in the houses. The rules regarding such inspections are laid down in Section 10 of the Act, Appendix XI. Health Officers of the 1st and 2nd grades are well educated and responsible officials and we consider that the restriction in proviso (b) of this section might be removed in their case.

During our tour we received complaints from the keepers of lodging-houses regarding these late-inspections. On these complaints we do not place much weight; but there are obvious objections to night inspections and we should like to see their number reduced. In Hardwar, we understand, the difficulty has been got over by requiring each lodging-house keeper to maintain a register of lodgers giving the name of the lodger, his residence, the number of his family and servants and the date of his arrival and departure. The inspecting officer is then able at his day inspection to check the entries in the register and see if they are properly maintained by ascertaining if the names of those inmates he finds in the house have been entered. This check appears to us sufficient for all practical purposes and would to a great extent do away with the necessity of night inspections. The maintenance of the register would entail very little clerical work and we recommend that it be adopted for all lodging-houses in this province. Right of entry at all times might then be given to the Magistrate and Health Officer only, and the visits of all other authorised persons be limited to day time between the hours of 8 A.M. and 8 P.M. except in the case of an officer deputed by the Magistrate for some special purpose.

14. The fees payable by the lodging-house keeper are laid down in section

8 of the Act, Appendix XII. These are

Licensed lodging-houses—Enhancement of fees for licenses taken out after a fixed date. based on the capacity of the house and this we consider the most equitable method of calculation that could have been

adopted. There should, however, be provision for enhancing the fees in the case of late applications for a license. The number of pilgrims likely to attend any particular festival must always be somewhat uncertain and the lodging-house keeper very naturally tries to postpone licensing as long as possible in the hope of getting more accurate information: he does not wish to take out a license for 75 lodgers when 70 might be the maximum that he will have to accommodate at any one time and a license for that number would have sufficed. Were the number of licenses small, and the time necessary for inspection short, this tendency to postpone the taking of licenses would be of little consequence but unfortunately this is not so. In Puri the average annual number of houses licensed during the period 1909-13 was 952 with accommodation for 30,245 lodgers and in Gaya 547 and 27,187, respectively for the period 1910-12. The inspections for, and the issue of, such large numbers of licenses necessarily takes time and when applications are received late, as constantly happens, not only is a thorough inspection impossible but there is always considerable friction and annoyance due to delays, and great difficulty in having the necessary repairs and alterations carried out in time. Further, the giving of licenses to late applicants on the same terms as to those who loyally assist the authorities by applying early is an unfair handicap on the latter. We would recommend that in each place of pilgrimage a date should be fixed as the normal one for the issue of licenses for the ensuing twelve months, that applications for renewal of license should be sent in at least 15 days, and for new licenses at least 30 days, before that date and that late applications should be surcharged according to the time of their receipt up to a limit of 50 per cent. of the ordinary fees. To meet the difficulties of the lodging-house keepers as far as possible the licensing date should be fixed at each place with reference to the chief festival of the year but should be not less than 3 months prior to it.

15. Under section 28 of the Lodging-House Act the District Magistrate, with

the assent of the Health Officer or the Civil

Licensed lodging-houses—Bye-laws under the Act should indicate sanitary requirements considered necessary.

Surgeon of the district, is empowered to make bye-laws for certain specified purposes and to repeal, alter or amend them subject to confirmation by Government.

This power has been exercised and bye-laws framed in each of the five "places of pilgrimage" visited. These bye-laws supplement the provisions of the Act in several particulars but we consider them defective in that they omit any indication of the minimum standards in respect of the several sanitary requirements which will be insisted on before a license is granted. What is, or is not, necessary is left wholly to the discretion of the Health Officer. From the point of view of the lodging-house keeper this is unsatisfactory as it gives no security that any improvements which he may make in his house at the instance of one Health Officer

will necessarily meet with the approval of the next: in short, he is deprived of that sense of security in his business which he has a right to expect. In our opinion it would save much friction, and make for efficiency generally, if the minimum standards which would be accepted for the different sanitary requirements were embodied in the bye-laws. It is not our intention to lay down what these should be. It would, indeed, be impossible to do so with the very varied conditions existing in the different places of pilgrimage: standards which would be right and proper in Gaya with a piped water supply and sewerage would be wholly out of place in Bhubaneswar which has neither. It would, we think, be useful, however, to discuss the several requirements and to indicate the lines on which bye-laws, embodying the necessary standards, with due regard to present conditions, might be framed under the Act.

16. From a sanitary point of view the requirements of lodging-houses may be stated thus. There should be enough

Licensed lodging-house—Sanitary requirements. room, that is air-space and sufficient ventilation; for each lodger there should be ample light; there should be a pure

water supply; there should be adequate bathing, latrine and urinal accommodation of a good type; there should be good drainage, receptacles for refuse and a sufficient staff to keep the house and its appurtenances clean and well swept; cases of infectious or serious sickness and all deaths should be reported without delay and there should be an inspecting staff working under conditions which make it possible to see that the rules are carried out.

(a) The first requirements are air-space and ventilation. We would suggest that the superficial area, and air-space, allowed for each lodger, excluding children

under 3 years of age, should be not less than 24 square feet, and 240 cubic feet, respectively. If it were practicable a minimum greater than this would be advisable but even at the most important pilgrim centres the lodging-houses do not maintain their maximum population. It should on no account be lost sight of that for the greater part of the year the accommodation is in excess of the requirements and that on all great festivals the supply is unequal to the demand. It is impossible that it could be otherwise, and to attempt to insist on a too great air-space for each pilgrim lodger at the great gatherings is bound to end in failure: either the rules would be infringed or hardships would be inflicted on the pilgrims by limiting the amount, and raising the already high price, of accommodation. In consideration, however, of the fact that the scale suggested is a meagre one ventilation as good as possible should be insisted on. Each room should, we consider, be provided with barred apertures, exclusive of the door way, of a total area not less than one-tenth of the floor area; these apertures should open directly on to an open space or verandah and at least one-half of the total area should be permanently uncloseable. Wherever possible through ventilation should be required. In some of the older houses this amount of ventilation may not be obtainable: in such cases the floor area and cubic space for each lodger should be correspondingly increased.

A ticket stating the number for which each room or verandah is licensed should be affixed in a conspicuous position either over the lintel or on one of the verandah posts. This is necessary to prevent the lodging-house keeper using rooms which at the time of inspection for license the Health Officer has refused to pass as fit for human habitation or were stated to be godowns or cook-houses.

At the larger festivals the above standards might, we consider, be relaxed in special cases and the lodging-house keeper be allowed to take in lodgers in excess of the number specified in his license to the extent of not more than 25 per cent. From a purely sanitary point of view such relaxation is to be condemned as permitting overcrowding at a time when the outbreak of epidemic disease is most likely to occur and, if it should occur, may have the most disastrous results. On the other hand, the demand for accommodation varies tremendously. For the greater part of the year there is more than enough room but at all important festivals, pilgrims flock in, in multitudes. It is obviously impossible that sufficient accommodation for all who wish to stay in the lodging houses on the occasions of the chief festivals should be maintained throughout the year. But the better

class pilgrims must find shelter somewhere, and it is better that they should get it in a lodging-house fitted with proper sanitary conveniences, and where sickness amongst them will be reported, than that they should huddle in any hut they can find, or lie out in the open. Two important interests come here into conflict—the prevention of disease and the comfort of the pilgrims. After careful consideration we have come to the conclusion that overcrowding in the lodging-houses on the occasions of the chief festivals is inevitable and unavoidable. This overcrowding should, however, not be allowed indiscriminately in all lodging-houses but should be permitted only where it would be likely to do least harm, that is, in the best regulated of those houses. We would recommend that the Health Officer should at the time of inspection for license enter on each certificate the percentage of excess accommodation which might be permitted at a time of urgency. If the excesses noted in these certificates were proportionate to the sanitary condition in which the houses were usually maintained and were made a basis for deciding any grants of special licenses under section 21 (2), of the Act, the general tendency would be for lodging-house keepers to raise the sanitation of their houses above the minima laid down in the bye-laws so as to obtain the maximum excesses permissible. A certain amount of competition would occur which could only result in good and a gradual mitigation of the evils attending present overcrowding.

(b) The same provision as we have suggested above for ventilation might be accepted as a minimum for lighting, but,

Light.

should the barred apertures open into a space other than one six feet broad and open to the sky in its whole extent, the requirements should be increased by 50 per cent.

(c) There are few lodging-houses in which the wells are not liable to serious pollution either from their proximity to

Water supply.

latrines or cesspools or from the absence of

a protecting parapet to the well mouth and of satisfactory drainage for spilled water. They must also all be constantly exposed to contamination by the vessels of the many lodgers drawing water. Wherever therefore a filtered pipe water supply is available it should be made incumbent on all licensed lodging-houses to have it laid on to the house. All wells on the premises should then be closed with the exception of one which should conform to the requirements given later: if the piped water supply is a continuous one an endeavour should be made to have this well closed also. In this connection it is necessary to note that one hears frequent references to certain religious objections to the use of a piped water. We have had special opportunities of examining this point and from the evidence before us have little doubt but that such prejudices, if they exist, would be exceedingly short lived if a piped water supply were made convenient and ample.

In those towns where a piped water supply is not yet available wells are necessary but to ensure as great a freedom from contamination as possible the bye-laws should require that each (1) should be built of solid masonry down to water level, (2) should have a parapet wall $2\frac{1}{2}$ feet high round the well mouth and outside of this a protecting platform all round at least 4 feet wide and provided with a masonry drain to carry off all spilled water from the proximity of the well and (3) should be in no case nearer to than 25 feet from a latrine, urinal, cesspool or other receptacle for filth or rubbish. An endeavour should be made to get each well covered in and provided with a semi-rotary or other suitable type of pump: where this is not done the well should be disinfected with potassium permanganate at least once weekly during all the larger festivals.

(d) From the health point of view the most important parts of a lodging-house are its latrines and urinals but it was

Latrines and urinals.

obvious at our inspections that, with a few

exceptions at Puri, these are as a rule consistently and grossly neglected. Any dark closet, not required, or unsuitable for anything else, appears to be considered sufficient accommodation for this purpose and the condition into which these closets had been allowed to fall was frequently indescribable. In such places flies breed freely and spread from them the infection of cholera, dysentery and diarrhoea. The necessity of having the latrines and urinals of a suitable pattern, sufficient in number, always clean and thoroughly well served, cannot be too strongly insisted on.

In every town where there is a sewerage system the lodging-house latrines and urinals should be of the water-flush pattern and connected to the sewers. In most places, however, this solution of the difficulty is not possible and hand service has to be adopted. In such cases the essentials which should be required by the rules are (1) that there should be a clear space of 3 square feet for each seat, (2) that the seat, the space below it and the walls to a height of 2 feet above it should be built of some non-absorbent material, (3) that the floor of the space below the seat should be at least 6 inches above ground level, (4) that the liquids and solids should be separated and that the pans or buckets placed to receive them should be of a suitable size and shape, should not leak, should have an easily cleansed surface and should fit close under the seat, (5) that the latrine should be easily accessible from outside for cleaning, and (6) that it should be well lighted and ventilated, having for this purpose, for each seat, an aperture in one of the walls, or in the door, of at least 2 square feet in area and opening direct to the external air.

For urinals the requirements should be similar.

A very common type of latrine is one situated on an upper floor or on the roof and from which all excreta fall through a long shoot to ground level. In these the sides of the shoot quickly become coated with filth and an excellent breeding ground for flies is formed especially at the bottom of the shoot. No latrine of this form should be permitted.

In every lodging-house there should be separate latrine and urinal accommodation for males and females and in no case should it be less than in the proportion of 2 latrine, and 1 urinal, seats for males, and 3 latrine, and 1 urinal, seats for females, for each 100 lodgers allowed in the license.

(e) In the majority of lodging-houses that we inspected no special provision for bathing had been made and the inmates

Bathing accommodation. as a rule bathed in any corner of the courtyard. Where the latter is flagged or laid in cement and well drained this arrangement is quite suitable and meets all sanitary requirements but otherwise it is objectionable. We consider that in every lodging-house accommodating more than 20 lodgers there should be provided one bathing place each for males and females : the floor should be laid in concrete or flags and should be connected by a masonry surface drain with the general drainage of the premises.

(f) In many lodging-houses there is no drainage of any kind and spilled water, sullage and even rain water are

Drainage. allowed to lie about in pools and puddles

till they dry up by absorption or evaporation : in others the drains lead to an unlined cesspool in the courtyard or to a cesspool, or on to the surface of the ground, immediately outside the boundary wall. In those lodging-houses which have water-flush latrines and urinals connected with sewers, the drains must be underground but in all other cases they should be on the surface so that they can be readily flushed and cleaned : in no case should they be allowed to pass under the floors of rooms. They are best constructed of glazed earthenware half pipes laid in cement but any material which will give a smooth, even, non-absorbent surface is satisfactory. They should discharge into the street surface drains if these have been constructed to receive sullage, otherwise into a cesspool made of some impervious material and so situated that it can be easily emptied from outside the house.

(g) In the majority of the lodging-houses seen the living rooms were clean and well swept : only in the courtyards was

Sweeping. rubbish and refuse left lying about and this,

as a rule, was apparently due to the absence of any receptacles into which it could be thrown. For the collection of refuse open kerosine tins which have been tarred both inside and out are eminently suitable and these should be provided in a proportion of at least 1 for each 10 pilgrims allowed in the license.

(h) To enable a Health Officer to deal successfully with infectious disease

Notification of infectious disease. two things are essential—that he should be given the earliest possible notice of each

case as it occurs and that he should have powers to take the necessary precautions at once : to a fault in one, or both, of these respects nearly every outbreak of infectious disease can be traced. Section 13 of the Act requires every keeper of a lodging-house to report at once all serious cases of sickness or deaths which may occur therein to the nearest police-station. This is right and necessary so far as it goes, but it is not sufficient, and the further procedure to be adopted on receipt of the report by the police should be laid down clearly in the bye-laws. In Gaya especially we found the action taken under this section of the Act very dilatory and defective and to this is probably due much of the infectious sickness which occurs in that town. The action which we consider necessary to prevent or lessen the spread of infectious disease in, and from, lodging-houses may be stated shortly as follows. The lodging-house keeper should be required to report all cases of serious sickness and every death as at present and not only infectious cases, otherwise he will evade the order on a plea that he did not think the case an infectious one. The nearest police-station is the most convenient place for this report to be made. On its receipt the police should at once inform the Health Officer who should personally visit the house, or send a trained assistant, to diagnose the case. In the event of the sickness being infectious, removal of the patient to hospital will be necessary in the interests both of the other lodgers and of the patient himself, and the necessary powers to have this done should be given to the Health Officer. Isolation in a lodging-house, under present conditions, is impossible and the only alternative to removal of the patient is to close the lodging-house and so scatter the lodgers, all of whom are potential contacts and who may therefore be incubating the disease, to other lodging-houses throughout the town. This, though frequently done, we consider a most dangerous procedure and one which should never be adopted : rather every endeavour should be made to induce those possible contacts to remain in the lodging-houses where, if disinfection has been properly carried out, they incur no risk and where it would be easy to keep them under observation. Moreover, the closing of the lodging-house must inflict a heavy pecuniary loss on the keeper which he will naturally try to avoid by the concealment of cases whenever possible. The Health Officer, or his assistant, should supervise the arrangements for the removal of the patient so that this may be effected with every care and attention to the latter and without risk of further infection. Such parts of the lodging-house as are likely to have become infected should then be disinfected under trained supervision. To leave this to be done by the lodging-house keeper, as is the custom in Gaya, is only to court disaster while, if the disinfection be given to a subordinate unfamiliar with the requirements, much needless labour and expense may be incurred. The keeper of the lodging-house should be obliged to render all the assistance that he can but the actual measures should be under the direction of the Health Officer or his assistant. Finally, the lodging-house and its inmates should remain under somewhat closer observation than usual for a period slightly greater than the usual incubation period of the particular disease a case of which had occurred.

The above are in our opinion the essentials which have to be attended to in dealing with infectious disease in lodging-houses, and the various points should be embodied in the bye-laws so that the duties of each person concerned may be well known to all.

(i) At each of the places of pilgrimage the Health Officer is the inspecting medical officer for lodging-houses. Under **Inspecting staff.** Section 10 of the Act the Magistrate and any person to whom he may give authority in writing are also permitted to inspect but inspections by any of these officers would be exceptional and as a rule are made only during the larger festivals. In practice almost the whole of the work falls on the Health Officer and he it is who has to measure up all the rooms, go into details of ventilation, water supply, drainage, privy accommodation, etc., and then decide on the number of pilgrims for which a license should be given. He has also to pay inspection visits to see that the rules regarding overcrowding, cleanliness, reporting of sick, etc., are complied with and, should a case of infectious disease occur, to arrange for the removal of the patient to hospital and to supervise the disinfection of the premises. The amount of work which this would entail if properly carried out may readily be gauged from the following table which

gives the approximate number of lodging-houses in each of the five places of pilgrimage visited :—

Place.					Number of licensed lodging-houses.	Number of lodgers that can be accommodated.
Puri	...	...	...	...	952	30,254
Gaya	...	...	...	...	547	27,187
Deoghar	...	...	...	...	62	2,780
Bhubaneswar	...	...	...	...	25	...
Satyabadi	...	...	...	...	3	...

In Puri the Health Officer has one, and in Gaya two, inspectors of lodging-houses to help him with the work, and in the latter town extra assistants also, are appointed temporarily during the chief festivals. None of these men, however, have any special training in the technical part of their duties and the brunt of the work necessarily falls on the Health Officer. From the evidence before us and from what we have seen at our various inspections the work at present is nowhere done with sufficient thoroughness to exercise any great influence in checking the spread of infectious disease. Much as this unsatisfactory state of affairs may be deplored it is scarcely to be wondered at. The two Civil Surgeons and the Assistant Surgeon who are at present Health Officers under the Act have numerous other duties and are quite unable to spare the time that is necessary, while the Compounder who is Health Officer for Bhubaneswar, Satyabadi and the road between these two towns and Puri, has much too large an area to supervise efficiently and, moreover, does not possess the requisite technical knowledge. If our recommendation in paragraph 12 is accepted the conditions should be improved : the work connected with the lodging-houses will fit in with the general work of the municipalities and, the staff for both being under the same control, transfers will be possible at times of special pressure : in both these respects the tendency should be towards efficiency. But the change will not be sufficient ; extra trained staff will also be required. A Municipal Health Officer has many and various duties to attend to and with the standard of sanitation rising yearly the demands upon his time are rapidly increasing. Moreover it is just at the times when the place of pilgrimage is thronged with visitors, and the lodging-houses need the most careful inspection, that the Health Officer's other duties are also heaviest. The employment at such times of additional temporary assistants for lodging-house inspection, as is done in Gaya, we consider undesirable : men of the right stamp are difficult to obtain and are untrained, their opportunities for petty oppression and extortion are great, and supervision and control are almost impossible. We would recommend that wherever the number of lodging-houses exceeds 100, a permanent trained sanitary inspector for every 150 lodging-houses should be employed to assist the Health Officer.

17. At almost every place of pilgrimage in India are to be found dharamshalas built by the pious for the convenience of travellers. The construction of such resting places is a work that naturally

appeals to the charitable. The rich pilgrim, visiting a holy shrine with his mind freed from ordinary worldly cares and turned rather to his spiritual welfare, will have vividly brought before him the discomforts of his less favoured brethren who, from poverty, may be compelled either to find what shelter they can in the poorest of surroundings or even to lie out in the open. Naturally he will bethink himself of how he can better the conditions of these poorer co-religionists : the construction of a dharamshala obviously suggests itself ; and so we find these

houses of shelter at almost every place of pilgrimage. They are usually large and roomy masonry buildings that afford lodging, and at times food also; in some cases for all classes of pilgrims, in others for the members of a particular sect or caste. In this province the number of free dharamshalas is not large but we inspected them whenever opportunity offered; we visited them under all conditions, both sparsely tenanted and crowded to their utmost, and had ample opportunity of seeing how deservedly popular and useful they are.

18. Recognising fully as we do the utility of dharamshalas, we are compelled to refer to a point of great importance in connection with their up-keep. While provision is frequently made for this by some form of endowment such as the renting

Dharamshalas—frequently not endowed.

out of part of the dharamshala as shops, houses, etc., it is unfortunately also common for them to have no form of endowment whatever for future up-keep. The pious founder builds a dharamshala generally in his old age; the building calls for few or no repairs during the short span of life left to him but such as are required are as a rule willingly done; it is after his death that the difficulties begin. If no money has been left for the up-keep of the dharamshala it is only in the rarest of cases that anyone will come forward to maintain and look after it. It might reasonably be thought that a sense of duty and filial piety would suffice to prevent the heirs of the pious founder from allowing the work of their ancestor to be thus nullified, but even they are seldom willing to spend the money necessary to keep the dharamshala from falling into ruin and consequent uselessness. In this country a pious and charitable man prefers to build a new dharamshala rather than repair those already in existence, even if they have been built by his friends or relations.

We have already pointed out how useful these dharamshalas can be. On the other hand, the ruined and uncared-for dharamshala very quickly becomes a depository for all kinds of filth or rubbish and its condition is soon not only a nuisance and danger to the public health but such as to debar the pious founder from acquiring that merit to which by right he should be entitled. Both from a utilitarian, a religious and a sanitary point of view, therefore, it is of the utmost importance that these dharamshalas should not be allowed to fall into disrepair. We saw no ruined or uncared-for dharamshalas during our tour in this province but they are numerous elsewhere. We would strongly urge on the charitable donors of these most useful institutions, therefore, the importance either of endowing them fully or of handing them over to some public body; they may then rest assured that the buildings they have founded, instead of becoming a reproach to their names after one or at most two generations, will go down to all time as a monument to their charity and piety.

19. As regards sanitation dharamshalas fall into quite a different category

Dharamshalas—Sanitary conditions. from the lodging-houses. The latter are kept for profit and run on hard business lines. The dharamshala on the other hand is built by a rich gentleman as a charity; no question of any monetary return is entertained, the sole recompense for his outlay being the religious merit he will earn. Naturally under these conditions the size, the decorations, the quality of the accommodation and the general conveniences are all designed by the builder on a scale which will mark, if not also enhance, the social position and wealth of the donor. The result is seen in big masonry buildings divided off into well lighted and ventilated rooms fronting on to spacious open courtyards and otherwise well suited for the accommodation of travellers. In our experience the dharamshalas are structurally much in advance of the average lodging-house as regards sanitation and they comply fully as a rule with most of the sanitary regulations which we have recommended for lodging-houses: if they fail it is usually in regard to conservancy. Unfortunately the need of really good sanitary closets is not often appreciated and it is in this respect that many dharamshalas fall short of what is required. There are exceptions to this description, but they are not many.

20. At present dharamshalas are under no special sanitary control beyond that which applies to any private house in the same area. Practically all the witnesses who gave evidence before us considered this insufficient and were in favour of **Dharamshalas—Need for sanitary control.**

bringing dharamshalas under control similar to that applied to lodging-houses: a few took an opposite view. These latter held that, in consideration of the well known sanitary conditions usual in dharamshalas, their immunity from being the starting point of epidemics, and the fact that they were charitable institutions, they should be exempted from all special sanitary rules. With this view we are unable to agree. Dharamshalas are resorted to by pilgrims from all parts of India in exactly the same way as lodging-houses and are therefore liable to the same danger of imported infection; indeed this danger is somewhat greater in the case of dharamshalas as infection is commoner amongst the poor than amongst the more wealthy. The fact that they are charitable institutions therefore increases the need for good sanitation rather than otherwise. The statement also that they are never the starting points for epidemics is not correct, but experience shows that, in proportion as they have voluntarily complied with the different sanitary regulations regarding overcrowding, conservancy, reporting of cases of sickness, etc., which we have recommended should be applied to lodging-houses, so have they been less likely to become foci for the spread of infectious disease. Instead of being a reason for relaxing sanitary control, however, we consider this the strongest of arguments in favour of making these regulations compulsory on all dharmshalas. Obviously the only result of such action would be the very desirable one of raising the standard of those dharamshalas in which sanitation is at present neglected while leaving unaffected those others in which the sanitary regulations are already voluntarily observed.

From a sanitary point of view dharamshalas and lodging-houses are practically on the same footing: the fact that, in the one case, the cost of lodging has to be paid for, while, in the other, it is defrayed by charity, does not affect the question: each receives pilgrims from all parts of India and is therefore liable to the same risk of imported infection and of becoming a centre for the spread of disease. The control then should be similar. The fact that many dharamshalas have acquired a certain amount of immunity by voluntary compliance with the usual sanitary rules, in our opinion, only makes the case for the general application of these rules stronger: in a word, if the sanitary arrangements are good the inspection and control will be nominal and can do no harm to anyone: if the sanitary arrangements are bad, control is essential.

21. While we consider it necessary in the interests of 'public health' that dharamshalas should come under sanitary control similar to that exercised over lodging-houses and nearly all the witnesses that came before us agreed that this was

Dharamshalas—Need for special legislation. desirable, we are not in favour of having them licensed and brought under the provisions of the Lodging-House Act. All the evidence goes to show that any attempt to do so would undoubtedly be resented both by the owners and the public generally. The former are men of some wealth and position; perhaps it was partly to emphasise this that the dharamshalas were built and dedicated; at any rate they feel and rightly feel that they have done a generous act which should advance them in the public estimation and entitle them to some consideration. On the other hand to be required to take out licenses for their dharamshalas under the Act would, they think, rightly or wrongly, have the opposite effect and, by associating them in the eyes of the people with the keepers of common lodging-houses, submit them to an undeserved humiliation. To the people dharamshalas are charitable institutions which are, or should be, free to all alike; they have been founded in the name of religion and as such are entitled to preferential treatment. Both the objections are purely sentimental ones but the feelings underlying them can be readily understood and appear to be very widely and deeply rooted amongst the people. What is required, in our opinion, is a special Act for dharamshalas requiring their registration, and giving power, as in the case of the Lodging-House Act, to the District Magistrate and the Health

Officer to make simple bye-laws, subject to confirmation by the local Government, regarding inspection, airspace and ventilation, lighting, water supply, conservancy, drainage, the reporting of sickness and death and general cleanliness. To this we think there would be no objection. With each of the requirements named the owners of dharamshalas are familiar and with most of them they already comply: there would be nothing to fear therefore from their being made legal. No fees should, however, be required and there should be no obligation to report the names of pilgrims arriving or departing.

22. Closely associated with the question of the housing of the pilgrims is the
Building rules. larger one of housing generally and the need for the regulation of building at places

of pilgrimage. Congested and overcrowded areas are common in Indian cities but they are prone to develop in a peculiarly aggravated form in the sacred towns. As these places grow in importance and population, proximity to the principal shrines becomes an asset of increasingly greater value and the houses become packed more and more closely together. Already this process has reached an acute stage in Gaya where the whole vicinity of the Vishnupad Temple is occupied by large blocks of lofty masonry buildings separated by narrow and irregular gulleys only a few feet in width. With the resulting obstruction to traffic, especially during the more important festivals, we are not directly concerned but the effect on the public health is of still greater importance. In such overcrowded areas conservancy is a matter of extreme difficulty and the site is soon fouled; dysentery and diarrhoea become rampant and should cholera be introduced there is every chance of the infection being widespread and severe. Moreover there is little circulation of air and light is almost wholly excluded from the lower portions of the houses; the close dark rooms are hot beds of tubercle and other lung diseases. The results are well illustrated in the high death rates in Gaya from "fever", "respiratory diseases", "dysentery and diarrhoea" and "all other causes" shown in Appendix XIII.

In Puri and Deoghur congestion and overcrowding have not as yet developed to an equal extent, but it is obvious that the same tendency is present there also. Already the streets have been encroached on and the lanes are narrow and tortuous. Unless precautions are taken soon it will be only a few years till defects similar to those existing in Gaya are repeated in both these towns.

Under Section 241 of the Bengal Municipal Act power is given to the Commissioners to frame rules for the regulation of building within the limits of their municipalities. In Deoghur no such rules have been made, but in Puri and Gaya bye-laws have been passed and copies are attached as Appendix XIV. In neither case, however, are the provisions sufficient to check the present tendency to overcrowding and congestion: those for Gaya indeed are useless for this purpose. In illustration we attach (Appendix XXV) an imaginary cross section, drawn to scale, of a road 12 feet broad (many of the main roads in Puri do not exceed this width) with houses such as might be built on either side of it without contravening the Puri bye-laws 4 (1) and 7. But even the very meagre restrictions here shown need not always be insisted on as clause 4 (2) of the bye-laws provides for their being set aside in any particular case by the Commissioners at a meeting. The only possible explanation seems to be that the Commissioners did not fully understand the meaning of the bye-laws which they were passing and this is borne out by the provisions of certain other clauses e. g. 15 and 17. We would strongly recommend that section 241 (1) of the Bengal Municipal Act be so modified as to allow of the ventilation and lighting of rooms being included as one of the matters concerning which rules might be framed and that a set of model rules under this section be prepared by Government for the guidance of municipalities.

Satyabadi and Bhubaneswar are both villages and in them the danger of overcrowding is not so imminent. Prevention, however, is better than cure and we would recommend that rules, but simpler than those for municipalities, should be put into force in these places also.

D.—INFECTIOUS DISEASE.

23. The main facts regarding hospital accommodation for cases of infectious disease are common to all the places of pilgrimage we visited. Each is liable to

Hospital accommodation. large inrushes of pilgrims and to regular and periodical outbreaks of cholera ; small-pox also occurs but to a less extent. Statistics of sickness from each of these diseases are not available but a table showing the total mortality caused by them in Puri, Gaya and Deoghar has been prepared and is attached as Appendix XVI. The figures in this table show very high preventable mortalities in each of these three towns and for this alone are deserving of attention. But the figures should not be read merely as statements of so many individual deaths but rather as representing a larger number of cases each of which was a potential and probable source of infection, through contacts, not only to the neighbouring districts but to every part of India. It should also be borne in mind that the figures do not by any means represent the total mortality which occurred from these diseases and that many deaths must have escaped registration.

As already stated the pilgrims at these centres stay either in lodging-houses, in dharamshalas, in maths, in temples or in temporary erections put up specially for them ; a large number also spend the nights in the open air, in groves or other convenient places. It is almost unnecessary to point out the unsuitability of the former places for the accommodation of cases of infectious sickness. Such cases are most common at the larger festivals just when the lodging-houses, dharamshalas and temporary erections are full to overflowing and every corner of available space is occupied. Isolation in such places is impossible, removal to a hospital is the only thing to be done in the interests of the patient himself and of those others lodging in the house. For cases of sickness amongst those sleeping out in the groves and open places ordinary humanity demands that full provision should be made.

The need for good and ample hospital accommodation for infectious diseases at these places of pilgrimage is obvious and at each the need has been recognised and partially met. At no place, however, was the accommodation sufficient or were the patients receiving the same care and attention as was given to ordinary cases of non-infectious sickness. This we consider a serious mistake. What is required above all else to stem an outbreak of infectious disease is early information of each case as it occurs so that steps may be taken at once for isolation of the patient in hospital and for disinfection. To secure early reporting of cases the confidence of the public must be gained and this can only be got, we are confident can be got quickly and easily, if they see that their sick are well housed in comfortable hospitals and that a good proportion of them recover. Fortunately recent advances in the treatment of cholera, the most important of the infectious diseases at these places, has greatly increased the percentage of "recoveries," but to get the best results it is necessary that the hospitals should be thoroughly well equipped and well staffed. This we consider should certainly be done. A patient with cholera or small-pox is individually just as deserving of careful nursing and treatment as a sufferer from one or other of the numerous non-infectious complaints and, from the point of view of public health and the damage which he is capable of inflicting on the community, he is of vastly greater importance. This point though frequently overlooked is one which cannot be too strongly emphasised and at all places of pilgrimage liable to outbreaks of infectious disease the hospital accommodation for such cases should, in our opinion, be of the very best.

There is always considerable difficulty in estimating the amount of accommodation which is required in an infectious diseases hospital. The ideal to be aimed at is that it should be sufficient to enable each case of any of these diseases to be isolated at once as it occurs and to be kept isolated until all risk of infection has disappeared. On the other hand infectious disease usually occurs in spasmodic outbreaks of greater or less intensity with intervals of absolute or almost absolute quiescence between : there is no regularity in the number of beds required for the sick and if full accommodation were provided for one of the larger epidemics most of it would probably lie idle for long periods. Under these circumstances no accurate estimate of future requirements is possible ; all that can be done

is to examine the past experience of each place and with that as a guide, making due allowance for any change in conditions, to strike as accurate a mean as possible. Suitable arrangements should also be made so that expansion may be easy when required. The method can have no claim to absolute exactitude but with reasonable care most of the larger errors can be eliminated. Moreover an infectious diseases hospital, it must be remembered, is in itself one of the most potent influences in checking the spread of infection and so rendering hospital accommodation unnecessary. It is indeed very largely an insurance against epidemics and an empty ward does not necessarily mean that any over-estimate of the requirements has been made : rather, as a rule, it is a matter for congratulation.

Regarding what we consider necessary at each of the places we visited we are making recommendations later when dealing with their individual requirements but there are certain important points more especially with reference to cholera which are of general application.

(a) When a patient goes to hospital it is the custom in India for him to be accompanied by one or two relatives as attendants. On general grounds this is undesirable in an infectious diseases hospital but it should be allowed. If it is refused no one will go to hospital willingly and sickness will be concealed. The choice is one between two evils—the small risk of infection to one or two relatives in the hospital, where the conditions are made as good as possible or the much greater risk to a larger number of relatives, and also to the neighbours, in the private house where but few, if any, precautions will be taken against infection. There can be no doubt as to which is the lesser danger. Moreover it is amongst the nearest relatives that contact infections are most likely to have taken place and there are definite advantages in having these persons isolated and under observation as they would be were they allowed to go to hospital as attendants.

(b) It appears to be the custom to accommodate all the patients together in a general ward quite irrespective of the class of society to which they belong. The wealthy pilgrim from the lodging-house and the beggar from the street are often placed in beds side by side. This arrangement is unsatisfactory and separate wards should always be provided for better class patients who are willing to pay for their treatment and food.

(c) The case mortality from cholera has always been high and even amongst the patients admitted to hospital the majority formerly used to die within one or two days. This has all been changed by the new treatment by "transfusion." A much greater proportion of the cases admitted to hospital now recover ; stay in hospital is proportionately longer and more accommodation is therefore required.

(d) After an attack of cholera convalescence is usually rapid and it has been the custom to discharge all cholera patients from hospital as soon as the more acute symptoms had subsided and convalescence was definitely started. It is now well established, however, that cholera "carriers" exist—that a certain proportion of the convalescents from cholera and also of the healthy persons who have attended on them continue to excrete virulent germs of that disease with their faeces and urine for a variable period, but, as a rule, not longer than from 2 to 3 weeks. Of 30 patients discharged from the cholera hospital at Puri in 1912, and investigated by Major Greig, I.M.S., 11 or 36 per cent. were found to be still excreting the cholera vibrio and therefore in a highly infective condition : of 27 attendants on the sick examined at the same time 6 or 22 per cent. were also "carriers." The danger to the community of a too early discharge of cholera patients from hospital is obvious and it obtained striking proof in the case of a small epidemic in Puri jail. A patient discharged "cured" from the cholera hospital in Puri on 13th July 1912 was arrested in Sakhigopal and sent to Puri Jail on the 23rd of the same month. He was placed in the under-trial ward and a few days later cases of cholera began to occur there. The outbreak was investigated by Major Greig and definitely proved to have originated from the prisoner discharged from hospital 10 days previously who was still infective. Similarly convalescent pilgrims if discharged from hospital too soon may start infections all over India. In all probability this is one of the chief means by

which cholera is carried from place to place. Sufficient accommodation therefore should be provided in hospital to allow of the patients being kept for some time, preferably about 2 weeks after the acute symptoms have disappeared, instead of being discharged at once. These convalescent patients should be housed in special wards apart from those suffering from the acute disease.

(e) It is undesirable that the attendants on patients suffering from different diseases should be allowed to mix freely together. Wherever possible the wards for different diseases should be in separate enclosures.

24. At all places of pilgrimage beggars swarm. This is common enough in many countries besides India as every **Lepers.** religion inculcates the duty of giving alms to the poor. With the question of begging generally we are not concerned: but one special aspect of it—the leper—was often brought to our notice. This most pitiable and too often loathsome creature trades on the miserable picture of his deformities to extort alms. Many pilgrims regard the disease as actively contagious and fears were expressed to us as to the result of lepers mingling in the crowd and bathing in the sacred tanks. Experience shows that, as a matter of fact, the danger of infection is very small, but we more than sympathise with the pilgrims who would be rid of these dreadful unfortunates and would recommend that every effort be made to get these lepers removed to asylums.

E.—WATER SUPPLY.

25. The part played in the spread of disease by overcrowding and close contact with the sick is obvious to every one and does not require demonstration: the **Water supply, conservancy and drainage—general.** influence of a polluted water supply or defective conservancy and drainage is not

so direct. It would have been of advantage therefore had we been able to give instances where epidemics of different kinds at places of pilgrimage had been definitely traced to these latter causes. This however is not possible. At a place of pilgrimage not only is the population constantly varying with the daily arrival and departure of pilgrims but the latter, during their stay, are perpetually on the move from one part of the town to another visiting the various shrines and places for bathing. To trace out under such circumstances all the different sources of infection to which each sick pilgrim might have been exposed and then, by exclusion, determine definitely the particular means whereby an epidemic had been spread would be an impossible task. The omission, however, is not really of much importance. Polluted water supplies and defective conservancy and drainage have already, time after time in other cases, been proved, and are now generally recognised as important agencies in the spread of disease: we are fully justified therefore in assuming that they are playing the same role at these places of pilgrimage also.

26. Gaya has recently had a water supply laid on in pipes: at all the other **Water supply.** places of pilgrimage the water supply is chiefly from wells and tanks but partly also, in the case of Puri, from a river.

(a) By immemorial custom in India the ordinary open tank, when conveniently situated, is used equally for the supply of drinking water, for bathing, for washing clothes and for watering and washing cattle: in the early mornings and evenings also, the lower classes frequently use its edges and immediate vicinity for the purposes of nature. These sources of contamination are usually in constant operation and the degree of pollution is frequently very high. When the tank is built of masonry, or is very large and deep, the pollution may be somewhat less but it is seldom that these tanks are safe or desirable sources for the supply of drinking water at places of pilgrimage, and their use for this purpose should be discouraged. Where they must be used steps should be taken as far as possible to reserve the best and most convenient for the supply of drinking water only. The tanks so reserved should be completely enclosed by unclimbable fencing and the water made available only through pumps fixed

outside. If this is not possible their edges and immediate vicinity should be cleared and very carefully conserved and their use for anything but the supply of drinking water should be severely punished.

(b) Rivers and streams are liable to pollution from the same sources as **Rivers.** tanks but in addition they very often receive most, or all of the sullage drainage

of the town. Where the river or stream falls to such an extent at times as to leave only a series of stagnant pools in its bed the water is liable to become exceedingly foul. If on the other hand the water is constantly moving, and being replaced pollution is not cumulative, the river water may be better than that from tanks and in proportion to the volume of flow. Sometimes, much can be done to improve a river supply by thoroughly conserving the banks, by intercepting any inflow of sullage and by preventing the formation of backwaters or barricading these off if they do form.

(c) For the supply of drinking water, wells are a great advance on either **Wells.** tanks or rivers. In rural areas the subsoil

water, unless very near to the surface, is

naturally pure, and granted reasonable care in the construction and protection of the wells, an excellent supply can usually be obtained from this source. But in towns, where the ground has been fouled by many generations of habitation, the subsoil water is much more liable to become contaminated and greater care must therefore be taken in the construction and protection of wells if a safe water supply from them is to be assured. In both these respects the wells seen at our inspections were as a rule defective.

As regards construction the following points require more attention. (1) If **Construction.** the ground water is less than 15 feet from the surface the well should pierce the first

"mota" and draw its supply of water from beneath that. (2) The well cylinder should be of impervious masonry to a depth of at least 15 feet. (3) The mouth of the well should be protected by a parapet wall $2\frac{1}{2}$ feet high and should be from 6 inches to 1 foot less in diameter than the well cylinder. (4) All round the well mouth there should be a masonry platform at least 5 feet broad and sloping to a masonry drain which will carry off all spilled water to a distance of at least 25 feet. (5) Over the well mouth there should be no beams, 'janglas' or other structures on which any one can stand while drawing water. (6) The pulleys should be so fixed that the water vessel when drawn up will be close to, and at a convenient height for lifting it over, the parapet wall. (7) There should be a roof over the well for shade and to protect it from falling leaves, &c. These matters are comparatively simple to arrange for in the case of public wells or of private wells for public use: in the case of purely private wells, which, in most places, are very numerous, few of them are attended to.

The protection of wells during use presents much greater difficulties than their **Protection.** construction and requires the constant attention of the health officer. Fouling of the water may take place in an innumerable variety of ways but perhaps the most common are, the use of dirty water vessels or ropes when drawing water; percolation of impure surface water into the well through cracks in the cylinder or where the roots of plants have penetrated between the bricks; the too close proximity of rubbish heaps and of leaky drains, cesspools or latrines; the trickling in of polluted surface water from the well mouth; bathing and washing of clothes near the well, and the falling into the well of dust, leaves and various other articles such as shoes, clothes, &c. Many of these dangers would be got rid of if it were possible to place a cover over the well mouth and affix a pump at a little distance or even alongside. Unfortunately pumps have, as a rule, found little favour where they have been tried. They are not liked in the first place and from ignorant handling they often break down: at times they are intentionally put out of order. The advantages to be obtained from their use are so great, however, that attempts to make them more popular should be steadily persevered with and the simpler the type of pump used the greater will be

its chances of success. Another expedient frequently resorted to is the appointment of special men, brahmans or kahars, at each well, to draw water for any one wanting it. This arrangement, though expensive, is useful at ordinary times but at big melas it is very difficult to work: the crowd quickly becomes impatient, breaks through the barrier and is soon drawing water for itself. At such times the only chance of success is to have long iron or masonry cisterns attached to the wells and fitted with stopcocks. These cisterns are kept filled by the kahars and act as a reserve at times of special demand. The attached photo. Appendix XVII, taken at quite an ordinary mela at Ajodhia, shows how crowded the wells often become. In default of either of these special protections reliance must be placed on more general measures of which the most important are as follows:—
 (1) The cylinder, the protecting parapet, platform and drain should always be kept in thoroughly good repair. (2) All the best wells should be reserved for the supply of drinking water only, special wells being set aside for bathing, washing of clothes, &c. (3) No rubbish heaps, cesspools, latrines or urinals should be permitted within a distance of 25 feet. If possible a greater distance is desirable but we recognise that this is not always feasible. (4) Each well should be thoroughly cleaned out annually. During cleaning a most varied assortment of articles is usually removed including boots and shoes, clothes, old waterpots, the remains of dead animals, &c., so that for caste reasons alone, if for no other, this cleaning is desirable. (5) At times of large melas, or when cholera is prevalent, every well should be disinfected with permanganate of potash at least once weekly. "Chloride of lime" is probably more effective as a disinfectant but this, in our opinion, is more than counterbalanced by other advantages possessed by permanganate of potash. With the latter drug there is a very obvious colour change in the water which makes the estimation of dosage for different wells simple and the disappearance of the colour later is an indication when the well may be taken into use again. On the other hand "chloride of lime" gives no such apparent change in the water and over, or under, dosage of a well is apt to occur; in the latter case the well will not be properly disinfected while in the former a taste of chlorine may remain and excite suspicion amongst the people, many of whom are, it must be remembered, ignorant villagers. Moreover chloride of lime rapidly deteriorates unless it is kept in sealed bottles.

(d) We have already stated that in most places private wells are numerous and that as a rule their construction is defective. The two facts go together as they

both depend chiefly on the height of the ground water. Where this is very deep the well must have a good cylinder and its cost is heavy so that only the rich can afford them; but where the ground water is high a small well can be easily and cheaply made and one may see them attached to almost every house. Unfortunately it is just in the latter circumstances that the ground water is likely to be polluted and special care in the construction of a well is most necessary. These small shallow wells, however, are often without any cylinder at all, are rarely provided with a protecting parapet or platform and are constantly much too close to leaking cesspools, drains and latrines: they are also the centres for all household bathing and washing so that the surrounding ground becomes sodden and overcharged with organic matter. Such wells are subject to continuous pollution and must be a constant source of danger to their owners. Their share in prolonging epidemics of cholera is well known: they must also be largely responsible for the spread of such diseases as diarrhoea, dysentery and typhoid fever.

The local authority has no power over private wells nor do we think that any legislation to give such power would be of much use. The protection of these wells is impossible in practice and for the great majority of them the only remedy would be to fill them in. On the other hand they are convenient and the people do not recognise any danger from them: any attempt to close them therefore would be considered a wholly unwarranted and unnecessary interference and would give rise to intense irritation. If the improvements we suggest below with regard to conservancy and drainage are adopted their liability to pollution will certainly be much lessened. In some cases also the health officer may be able to persuade the owners to allow them to be closed. But anything of the nature of a general order to close them we do not consider possible until the towns in which they are numerous have been provided with a constant supply of piped water.

(e) With a piped water supply the water is first purified if necessary and is then distributed in closed iron pipes so that any risk of pollution is reduced to a minimum.

Piped water supply. It is now generally recognised in all civilised countries that this is the best, if not also the only, method of procuring a safe and pure supply of drinking water in towns. It follows then from what we have said above regarding the liability to pollution of all the present sources of drinking water at places of pilgrimage that we strongly recommend a piped water supply for each of them. We would, however, go further and recommend that these supplies should be constant. In most towns in India the introduction of an intermittent piped water supply has been followed by a marked absence of epidemic cholera but the reduction of sickness and mortality from diarrhoea and dysentery has not been so great as might have been expected. This we attribute, at any rate in part, to the retention of private wells and the infection received through them. To get rid of these wells we consider a matter of very great importance but this will be difficult to effect so long as the piped water supply is only intermittent. The owners argue that with such a supply it is impossible to close their wells, and it must be admitted that there is considerable force in their contention. With a constant supply and a freer distribution of standposts and house-connections we consider that it would be possible to get most, if not all, private wells closed. We recognise that with a constant supply more expensive fittings would be necessary and that wastage of water would probably increase. But the closure of private wells is sufficiently important from a public health point of view to justify in our opinion the introduction of a constant water supply at places of pilgrimage, in spite of both these facts.

27. While bathing the majority of the pilgrims also drink so that closely associated with the question of a pure supply of water for drinking is that of the purity of the water in the sacred tanks. In most

Water of the sacred tanks and bathing ghats.

of these the water is stagnant and is never renewed except by surface drainage after rainfall. Where the tanks are small, as is often the case, the water would soon become foul from the bathing alone, as part of the religious ceremonies which have to be performed at the tanks, flowers, milk and pellets of ata or rice are thrown into the water and after bathing the pilgrims almost invariably wash the dirty clothes which they have just taken off. As a result the water is loaded with organic matter which gradually settles to the bottom and there forms a thick layer of foul decomposing slime. Even undisturbed the water of most of the tanks smells but when the black slime is stirred up from the bottom by a crowd of bathers it becomes unspeakably foul and the drinking of even minute quantities of it must be harmful. An improvement in the condition of these tanks we consider to be of the very greatest importance and with this object we are making various suggestions later in our report.

F.—CONSERVANCY.

28. At Satyabadi and Bhubaneswar conservancy takes the very primitive form in which practically all the inhabitants

General.

and visitors resort to the fields on the

outskirts of the inhabited area. There are few latrines (1 public) but they are seldom used. Only the towns of Puri, Gaya and Deoghur therefore need be considered. These have all practically the same system of conservancy differing only in details at each place. The system is one of hand-service, cartage and trenching, and the private as well as the public work is carried out by municipal agency.

29. Nearly every private house is provided with one or more latrines. These are of very diverse pattern but may be roughly classified under three common types. The first which is usually found in the larger houses, especially in Gaya and Deoghur, consists of a small closet usually situated beside the main entrance to the house. In this there is a masonry seat with an opening through which all excreta and ablution water fall into a masonry chamber underneath. For cleaning, the latter is provided with an opening on the side towards the street : which may

be closed by a door or a piece of cloth but is frequently without either. The liquids usually drain off into a cesspool or into a roadside surface drain : at Gaya sometimes also into an old underground sewer. The second type is usually found in houses of the same class and consists of a seat, on an upper story or on the roof, with an opening through which everything falls by a long shoot into a receiving chamber on the ground level similar to that of the first type. The third type occurs most commonly in the smaller houses on the outskirts of the town in Gaya and Deoghur but is met with everywhere in Puri. It consists of an unroofed mud-walled enclosure in the courtyard of the house, and is provided with a number of bricks or stones as foot-rests. As a rule the enclosure is devoid of receptacles and the excreta and ablution water fall on the ground there to disappear by absorption and evaporation or to remain till removed by the sweepers. None of these types is good but the first might be made to serve its purpose fairly satisfactorily if kept in good repair and well tended : the other two can never be kept clean and ought to be done away with entirely.

The duty of cleaning these latrines has been taken over by the municipality whose sweepers are supposed to mix the filth with any sweepings and refuse there may be and then remove it in baskets, open buckets, or earthen pots, to the nearest collecting dépôt or to the trenching ground. Except in Deoghur, however, the work was being badly carried out. Though our visits had been announced well beforehand and every opportunity had therefore been given to have something done, we found the majority of the private latrines full of semi-fluid decomposing filth and swarming with the larvæ of flies. There can be little doubt but that this is their normal condition ; that frequently the latrines remain untended for days together and that the house refuse, for which there are no receptacles, is usually simply thrown into the street. In Gaya and Puri the conditions were much worse than in Deoghur but everywhere they were bad. In addition to the nuisance and the smell that are caused, these defects in the conservancy of the private houses are without doubt a very serious and constant menace to the public health.

In Gaya and Deoghur much of the household sullage, including *both* bath and kitchen water, flows directly into the drains or sewers, but part is also collected in cesspools : in Puri it is in theory all collected in cesspools. As few of the courtyards are paved or drained and as most of the cesspools are leaky and pervious, by far the greater proportion of the sullage actually soaks into the ground.

30. The term public conservancy embraces a large variety of activities all directed to the general cleansing of the town site as distinguished from private premises.

Amongst these are included the general surface cleansing of all roads and of any unoccupied open spaces in, or on the outskirts of, the town, the cleaning of all roadside drains and public sewers, the removal and disposal of all sullage and urine, attendance on all cleaning of the public latrines and urinals and the removal and trenching of all nightsoil and rubbish including that brought from private houses to the collecting dépôts. We inspected this work constantly during our visits to the different places of pilgrimage and found that with the exception of the removal of sullage and urine and the disposal of rubbish it was, on the whole, much more satisfactory than that of the private houses.

The removal of sullage and urine was almost everywhere neglected but this can hardly be wondered at when one considers the absolute impossibility of any municipality being financially able to provide the staff and carts which would be necessary. In theory the cesspools are supposed to be emptied at intervals by the sweepers, the contents being removed to the trenching grounds, but a glance at Appendix XVIII will show that none of the local authorities possess sufficient staff or plant to overtake a tithe of the work. In actual practice only a very small proportion of the total sullage and urine of these towns is ever removed from the site : the remainder is allowed to soak into, and foul, the ground. The only efficient system of sullage removal in a town of any size is in our opinion by drains or sewers.

The same system of disposal of rubbish by dumping it into tanks or hollows was in operation in all three towns. The method adopted is well illustrated in the photograph, Appendix XIX, taken at Gaya. When rubbish is dumped in solid

heaps many feet deep, the organic matter it contains disappears only very slowly. Each time the heap becomes wet with rain considerable nuisance is caused and at other times the dry rubbish on the surface gets blown about as dust full of pathogenic bacteria and the eggs of numerous intestinal parasites. Incineration is the best method of rubbish disposal but this is not always feasible. The filling in of dirty tanks is a most useful sanitary work and frequently reduces very considerably the cost of refuse disposal but it is necessary that care should be taken to avoid nuisance. We recommend that where incineration is not possible the method of dumping shown diagrammatically in Appendix XX be adopted. No nuisance need then be caused even in crowded areas in the middle of cities. In all cases where this is done, however, the tanks should first be acquired by the local authority so that after reclamation the ground may remain as a park or play ground for public use.

Of other defects in the public conservancy most were peculiar to individual places and can therefore be dealt with better when considering the special conditions and requirements of those towns: certain matters, however, regarding staff and plant and latrines and urinals, are of common interest.

31. The three chief defects with regard to the conservancy staff noticed during our inspections were inadequacy in numbers, low pay and the want of trained supervision. Details regarding the staff at each of the three chief places of pilgrimage are given in tabular form in Appendix XVIII and from this it will be seen that the defects referred to were common to all.

(a) Local conditions regarding drainage, water supply, the proportion of private to public latrines, length of lead to trenching grounds, extent of roads, number of open spaces, etc., vary so enormously in different places that it is not possible to give a standard as to the number of sweepers required per mille of population which would hold good generally. If, however, we accept 2 lbs. (a very low estimate) as the quantity of nightsoil and refuse which has to be collected and disposed of daily for each unit of population it is obvious that one sweeper for every hundred inhabitants would not be too high an estimate of the everyday requirements of an average town. This proportion is not approached in any of the three towns, even for the resident population, and the deficiency becomes still more marked when we consider that large bodies of pilgrims are constantly coming and going, that the removal of sullage is also supposed to be part of the work of the conservancy staff and that not only women but also boys and girls are very largely employed.

(b) At each of these towns we received complaints of the difficulty in obtaining more sweepers. The cause is not difficult to find when we consider that the pay varies from Rs. 3 to Rs. 6-8 *per mensem* and that even the mates or peons in charge of gangs receive only Rs. 6, except in Puri where they get Rs. 8. As a matter of fact many of the sweepers are really only part-time servants of the local authority as they are forced to eke out the wages they receive from that body by doing work elsewhere. Sweepers are and always have been pariahs in India for whom anything is good enough and their wages have apparently been fixed on that basis. Little advance in public health, however, is to be expected unless the importance of their work is recognised. It will be a serious matter indeed if the sweepers are driven to other occupations and we would strongly recommend that their pay be raised to at least that of an ordinary cooly.

(c) At Gaya and Puri there are, three and one inspectors respectively, in direct control of the conservancy: at Deoghur the conservancy inspector is also municipal overseer. These men are all untrained and have no knowledge of what is essential in the work, what may be modified without danger, or in what way improvements may best be accomplished. In conservancy as in other matters technical knowledge and experience are necessary in the overseers if the work is to be satisfactorily done, and in our opinion only trained sanitary inspectors should be employed.

(d) At present executive control of the conservancy staff in each of these three municipalities rests with the **Secretary Control.** or overseer. Later we are recommending

that a Health Officer should be appointed to each town and that amongst other duties he should superintend and be responsible for the whole of the conservancy arrangements. Should these officers be appointed it will be necessary we consider to transfer to them also the full executive control of the staff otherwise there will occur a separation of responsibility and control which is likely to interfere seriously with efficiency. The transfer will at the same time lighten the work of the Secretary or overseer both of whom have many and varied duties to perform and whose time as a rule is more than fully occupied.

32. The same table Appendix XVIII which gives details regarding the conservancy staff also shows the most important items of conservancy plant in use at each of

the chief places of pilgrimage. For similar reasons to those given above, with reference to the staff, it is not possible to give standard requirements for public latrine and urinal seats, or for filth and urine carts, which would be generally applicable. The impression borne in on us during our tour, however, was that in each town the carts, sufficiently in repair to be actually in use, were deficient in number, while the latrine and urinal seats were too few and as a rule badly distributed.

(a) It has always been the custom in India for the large majority of the people to resort to the open fields for the purposes of nature: only in the larger towns

do we find private latrines in any large numbers. Public latrines are a comparatively recent innovation and it is natural that the people should try to keep to their life-long habits of resorting to the fields or, if these are too distant, to make use of any unoccupied ground that may be convenient. Especially is this the case with pilgrims most of whom are villagers who probably have never used a latrine in their lives. It is proverbially difficult to break fixed habits, but it is important that the present practices should be stopped, not only on grounds of decency and public health, but also on account of the labour and expense they entail for surface sweeping. To people accustomed to the open, however, the cramped and confined space of a badly tended, malodorous latrine is abhorrent and little progress is to be expected unless the public latrines are conveniently situated and are of a pattern that is comfortable and that can be kept clean. Few of the public latrines we saw in use complied with these conditions. They were often of very varied pattern even in the same place. This apparently is due to the fact that the local authorities themselves recognise the existing types as unsatisfactory and are searching after one which will fit in more with the ideas of the people and be freely used. The selection or designing of new types, however, seems to be left as a rule to the Secretary and as he can have only a very limited technical knowledge the result is not always fortunate. Most, that we saw, were defective both in design and construction. The points which in our experience, appear to be of importance may be stated shortly as follows:—

(1) A public latrine should be convenient. People will not go far from their houses during the rains and cold weather especially at night. If a latrine is well tended there is no need to place it a long distance away.

(2) It should be well lighted at night. Women and children are afraid to go to a dark latrine and even men will prefer to sit down outside.

(3) The entrance and seats should be sufficiently roomy to allow of any one entering and leaving without his clothes touching the walls or any other part. A narrow entrance and cramped seats are very common defects and are usually due to a desire to save expense: in our experience they are strongly objected to and result in the latrine being avoided. Each seat should be at least $2\frac{1}{2}$ feet broad by 3 feet deep.

(4) Latrines constructed wholly of iron are common. They were introduced on account of the ease with which they could be kept clean, but besides, as a rule, suffering from the defect inst referred to, they became intensely hot

during the day and are cold at night. They are not popular with the people who much prefer a masonry latrine.

(5) The whole of the latrine floor should be of good cement-concrete or other similarly impervious material and should be provided with drains so that every part can be thoroughly flushed out when necessary. If the floor is absorbent it will quickly become polluted and whatever may be done afterwards the latrine will always smell.

(6) There should be a roof but it is not necessary that it should cover the whole of the floor area: it should, however, extend over the whole area occupied by the seats. If there is no roof every heavy shower of rain is liable to wash filth over the floor.

(7) The seats should be sufficiently raised above the floor to just allow of the pans and buckets being slipped in beneath them. They should be impervious and have a smooth surface so that they can be easily and thoroughly cleaned if soiled. Glazed earthenware seats comply with these requirements, they wear well and are, in our opinion, the best: cement or Indian-stone seats are also good: iron seats, unless kept thoroughly well coated with tar, quickly corrode and are then difficult to keep clean.

(8) The partitions between the seats should also be of some impervious material for at least 2 feet above the seats. Iron sheets are very suitable for this purpose as they occupy little space. The partition need only be $4\frac{1}{2}$ feet high: in any case there should be a clear space of 2 feet between them and the roof.

(9) For ventilation there should also be a clear space 6 inches wide below the lower edge of the door.

(10) All odd corners under the seat are difficult to keep clean and should be avoided. The space beneath the seat should either be quite open or should be built in with solid masonry, cement plastered, so as to leave a space only just large enough to receive the pans or buckets. The floor of this space should be flush with that of the latrine or slightly raised above it.

(11) The pans or buckets should be strong and have smooth easily cleaned surfaces. They should have a capacity of at least 2 gallons and should fit close beneath the seats.

(12) The separate system is best for public latrines. Mixed nightsoil and urine very rapidly decompose and give off foul gases and for this reason alone their separation is desirable. Much more important, however, is the saving in labour and carting which may result, as the liquids, including abdast water, form about four-fifths of the total filth and may frequently be disposed of locally in the adjacent fields, or at a trenching ground much nearer than that which is used for the solids.

To prevent further useless experiments by local authorities with types of latrines already found unsuitable in other places, we would recommend that a standard pattern should be adopted for all new latrines at places of pilgrimage in this province and that local authorities wishing to deviate from that type should first submit their proposals to the sanitary department for approval. In Appendix XXI we give drawings of a hand-served latrine which has been found popular wherever tried in the United Provinces: it conforms to all sanitary requirements and is easily kept clean.

Later we are recommending that Gaya, Puri and Deoghur should be provided with complete sewerage systems and in that case all permanent public latrines should be of the water-flush type.

(b) At all the places of pilgrimage public urinals are much too sparingly distributed. If there is a good drainage system, however, as we are recommending later, suitable for the reception of sullage, and with arrangements for flushing, urine may also be passed into it direct without harm. In such cases all that is required for a urinal is a platform over the drain with a semi-circular screen three feet high fronting towards the street.

33. In the time at our disposal when on tour it would not have been possible to get together all the detailed local information necessary to enable us to lay down

Committee to consider detailed requirements at each place.

the staff and plant required for each of these places of pilgrimage. Nor would this

have been useful as, if the recommendations we are making with reference to other matters, drainage, sewerage, etc., are accepted, any estimate that we should have made would have been at once upset by the changes so introduced. We are convinced, however, that the whole of the details of the public conservancy at these places requires complete revision, and we would recommend that a small committee consisting of a Deputy Sanitary Commissioner, one member of the local body and the Health Officer, be appointed at each place for this purpose so soon as it is decided what improvements can be effected and what others must stand over for the present.

34. As already stated the system of conservancy at present in force at Gaya, Puri and Deoghur is one of hand-service, cartage and trenching. So far we have

Present system of conservancy should be replaced by sewerage.

considered only the defects in the methods of working the system, but there are others

inherent in the system itself, more especially when applied to a place of pilgrimage, which make it desirable that it should be replaced by a system of sewerage. These defects are expense, inefficiency in practice and lack of elasticity.

(a) A system which depends wholly on manual labour and carriage by cart must obviously be expensive, especially in towns where there are numerous long,

narrow lanes inaccessible to the carts. This is well illustrated in the case of the disposal of sullage and urine. There can be no doubt as to the desirability of removing these as completely as possible from the town site, yet, as we have already noted, this is rarely done. The reason is at once obvious when we inquire into the details of the service that would be necessary. The quantity of sullage and urine for each individual is certainly more than one gallon *per diem* but, even accepting this low estimate, two sweepers and one sullage cart would be required for its removal for each hundred of population. The expense of a staff on this scale would be altogether prohibitive for an Indian municipality. Automatic removal by drains is the only feasible method. The same holds good, though in a less degree, in the case of rubbish and nightsoil. A thoroughly efficient service for the removal of these is usually also negatived on account of expense. But the cost of the latter can be reduced by local incineration or the filling in of insanitary tanks and, of the former by sewerage.

(b) As a rule there are no conservancy lanes in an Indian town and it is, therefore, customary to find the private latrine of a house close to the main entrance,

Inefficiency.

and abutting on the street or lane used for the ordinary every-day traffic. It is in this thoroughfare that the sweeper has to work, going from house to house collecting the nightsoil, and mixing it with rubbish usually in an open tin or basket. At ordinary times the nuisance is considerable and is everywhere much objected to by the passers-by. It is at places of pilgrimage, however, and during the special festivals, that the system usually breaks down. We have already noted how the houses at these places tend to become more and more congested and the streets narrower and more tortuous as the sacred shrines are approached: it is there too that the crowds are densest and very frequently the sweepers are unable to carry on their work for days together. During our tour we constantly found whole blocks of houses where the latrines had not been cleaned for days, or if cleaned, the filth collected in tins, baskets or any other available receptacle and the sweepers unable to remove it. It is only with sewerage that these difficulties can be overcome: even if the people refused to instal water-flush closets in their houses, which is unlikely, pail depôts could be arranged at convenient sites, and all the conveyance of filth, both by hand and in carts, through the public streets be largely done away with.

(c) We have already referred to certain changes brought about by the railways with regard to the attendance of

Lack of elasticity.

pilgrims at these places of pilgrimage and the need there now is for making all the sanitary arrangements permanent and

elastic as far as possible. This has a special bearing on conservancy. Formerly the traffic at these places of pilgrimage was trifling except at the times of the more important festivals and holy days. The dates of these gatherings were known beforehand and in proportion to the expected inrushes of pilgrims special camping grounds were prepared, extra sweepers were called in from the surrounding towns and villages, temporary latrines and urinals were put up, and extra plant was bought: all these arrangements were temporary, and when the gatherings dispersed the sweepers were dismissed and the extra plant was stored or sold. With only a few festivals in the year, and with the dates of these definitely known well beforehand, this system, though somewhat expensive, worked satisfactorily. Where it now fails is with regard to the smaller festivals which are now more largely attended, the sudden and unexpected inrush of pilgrims on odd days, and the ever increasing daily pilgrim traffic throughout the year. For these occasions no special arrangements can, as a rule, be made as it is impossible to procure extra temporary sweepers and bullock carts at short notice: in other words the system lacks the necessary elasticity. We have seen that the ordinary conservancy staff and plant are inadequate for the needs of the resident population alone: overtaxed even at ordinary times the conservancy department breaks down with the unexpected arrival of even comparatively small crowds of pilgrims. This difficulty might be met by keeping the staff and plant always sufficiently in excess of the ordinary every-day requirements to be able to cope with all moderate-sized festivals without outside assistance. In our opinion, however, a much better solution would be the instalment of sewerage and this we strongly recommend. Formerly sewers were regarded with disfavour in India as it was feared that the climatic and other conditions would raise special difficulties and dangers. Experience, however, has shown that these fears were unfounded and that where they have been introduced they work well. Like drains they have the very important advantage of elasticity: the extra sullage and nightsoil of even large crowds of pilgrims would be dealt with automatically, and even at the larger festivals it would be possible to do away with much of the extra temporary staff and plant now necessary. At the same time water-flush latrines and pail depots could be introduced and the objectionable nightsoil depots and filth carts be done away with. Gradually it would be possible to get rid of most of the present very insanitary private latrines and the fly-breeding to which they almost invariably give rise.

G.—DRAINAGE.

35. Closely associated with conservancy is drainage but the conditions regarding the latter vary so greatly in the different places of pilgrimage we visited that it will be better if we defer discussing them till later, when the special requirements of each of these towns has to be considered.

H.—FOOD SUPPLY.

36. Almost the sole food of the pilgrims during their stay at Puri is the *maha-prasad* which has been consecrated by presentation to Jagannath. The conditions under which this food is cooked and sold are peculiar and will be discussed later.

Both at Puri and at the other places visited during our tour, but more especially at Gaya, we were met by general complaints as to the quality of the food-stuffs sold in the shops. The chief indictments were:—

- (a) that it was almost impossible to get milk of even fair quality;
- (b) that ghee, ata, etc., were constantly adulterated;
- (c) that cooking was badly done;
- (d) that puris and sweetmeats were often sold when old and stale;
- and (e) that most of the food-stuffs were covered, or mixed, with dust.

That the complaints were well founded we had ample evidence during our inspections. We saw milk being sold which was obviously much diluted with water: the ata was often imperfectly ground and full of dust: puris were constantly

undercooked, and the mixing and selling of stale, rancid puris and sweetmeats with those freshly prepared was common. To check our inspections, however, 36 samples of ata and 39 of ghee were collected from different shops and sent to the Chemical Examiner, Bengal, for analysis. Of the samples of ata 12 were reported of good quality, 10 of fair quality, 2 poor, 4 bad and containing a large proportion of bran, and 8 unfit for sale as ata. The ghee was much worse and of the 39 samples only two were reported to be of good quality : of the others, 2 were of fair quality, 3 were slightly adulterated with animal fat, 11 showed considerable adulteration with fat other than butter fat, and 21 were adulterated more or less largely and reported to be unfit for use as ghee. Though the evidence of sanitary officers and the records of analyses show that none of these defects are peculiar to places of pilgrimage, it is probable that they are more prevalent there, especially during the larger festivals. In any case the quality of the food obtainable at these places of pilgrimage is undoubtedly the cause of very widespread dissatisfaction amongst the pilgrims : it must also be a source of much sickness.

37. A certain amount of food inspection is done during the chief festivals but as a rule by officials who are poorly paid
Food inspection. and quite untrained : moreover at such

times they are usually very fully occupied with other work and the inspections are apt to be perfunctorily carried out. We have carefully considered the whole matter and are of opinion that while food inspection is necessary in the interests of the pilgrims, it is work which might very easily lead to abuses and should be entrusted only to well paid and reasonable officers. Erratic and occasional inspections at the chief festivals may lead to a high percentage of convictions of offenders but will do little good. What is wanted is regular and systematic inspection, conducted with patience and tact, throughout the year, so as to exercise a steady pressure towards a higher standard of quality. This we think should be one of the regular duties of a well paid and highly qualified Health Officer such as we are recommending should be appointed at each of these towns.

38. Much more important than adulteration of the food is the constant contamination to which it is subjected. Both the halwais and banias expose their goods for sale
Protection from flies and dust.

on uncovered trays and plates in the open fronts of their shops where they are constantly covered by flies. It must be remembered that not only are these pests bred in filth of all sorts, and very largely in the human nightsoil in the private latrines, but during their lifetime they feed indiscriminately on filth and on the sweetmeats, and pass freely from the one to the other. It is impossible in such circumstances that the latter should escape contamination and, where cholera, dysentery and diarrhoea are always very prevalent as in Puri, Gaya and Deoghar, that contamination is almost certain to contain the specific germs of these diseases. Much can be done to reduce the prevalence of flies and lessen this danger by rigorous attention to the conservancy of the town, but, combined with this, there should be scrupulous care and attention to the cleanliness of all food stuffs sold in the shops and to their protection from pollution by flies. A cheap and simple arrangement would be a wooden box with a glass front and a muslin purdah at the back. Some of the larger railway administrations have made very commendable efforts in this direction and photographs and drawings of their fly-proof counters, trolleys and trays are shown in Appendices XXII, XXIII, XXIV, XXV and XXVI. We are of opinion that the food-stuffs in the shops in the bazars should be protected by similar devices.

I.—HEALTH OFFICERS.

39. From the recommendations we have made it is obvious that we consider
Health Officers. that each of these places of pilgrimage should have its own full-time health

officer. The sanitary inspection of building sites and plans, the measuring, licensing and inspection of lodging-houses, the inspection of dharamshalas, the charge of infectious diseases hospital and the supervision of the measures for preventing the spread of such diseases, the inspection, cleaning and disinfection of wells, the charge and control of the conservancy staff and plant, and the inspection of food supplies, taken together make up a tale of work which is sufficient to occupy the full time and attention of the officer. All of these are important

and necessary duties which require technical knowledge and only a fully trained and well qualified health officer is competent to undertake them. We would recommend that Gaya and Puri should each have a Health Officer of the first grade and Deoghur one of the second grade, while Satyabadi and Bhubaneswar should have between them as health officer, a Sub-Assistant Surgeon who has passed the examination for Sanitary Inspectors.

J.—SURVEYS, ROADS AND LIGHTING.

40. Three subjects remain to be considered which, though not directly affecting the public health, have an important bearing on it indirectly. These are encroachments, roads and lighting.

(a) The difficulty of dealing with encroachments by private owners on streets or other public lands is common in **Survey maps.** all Indian towns, but in places of pilgrimage

and especially in the neighbourhood of the shrines it is particularly prevalent. In areas already confined and congested new obstacles to the traffic are gradually and almost imperceptibly added. But it is not only by blocking traffic that they cause inconvenience : surface cleansing, drainage and general conservancy are all rendered much more difficult. At all times the removal of these encroachments, once they have been made, is attended with great difficulty, but in the neighbourhood of shrines it is practically impossible owing to the plea of religion. Of obvious encroachments on public land we saw many during our tour. The only remedy is to have large scale authenticated survey maps showing the actual limits of property and we strongly recommend the early preparation of these for all places of pilgrimage.

(b) The value of good roads and communications in relation to the public **Roads.** health of "places of pilgrimage" is apt to be much underestimated. The part they

play though indirect is, we consider, of importance. The advantages of easy sweeping and freedom from dust are obvious, but it is as means of communication that good roads are of greatest utility. If the roads are bad, narrow or ill arranged there is a marked tendency for the pilgrims to congregate in dense masses near to the chief shrines or temples ; but with easy and convenient communications a much more regular and even distribution of the crowds, both by day and night, is brought about quite naturally, and this greatly simplifies the conservancy arrangements.

(c) Another indirect aid to improved sanitation, and one which is much **Lighting.** appreciated by the pilgrims on general grounds, is good lighting. At most of the

places of pilgrimage no advance has been made beyond the use of small oil lamps very sparsely distributed. There are now several satisfactory incandescent lamps of high illuminating power on the market and we would strongly recommend their use, especially at the shrines and tanks and at the camping grounds.

. PART-II.

RAILWAYS.

A.—INTRODUCTORY.

41. Earlier in this report we have pointed out how the railways have revolutionised **General.** **pilgrim traffic.** Of the lakhs of pilgrims that now visit, throughout the year, all the chief "places of pilgrimage" in this province the majority come by train. The villagers from the immediate vicinity may still flock to the festivals on foot and in their bullock carts ; but, even here, wherever the railway comes into competition with any other form of transport, it gradually ousts its competitors and the number of pilgrims arriving by rail tends annually to increase. The question of the transport of pilgrims by rail has been an important matter for our consideration.

42. Wherever we went we were inundated with complaints regarding the **Widespread dissatisfaction with railway arrangements at mela times.** manner in which pilgrims are carried and treated in their journeys by rail. This may appear to be in curious contrast with the undoubtedly very great increase in pilgrim traffic on the railways which has occurred within recent years but it is not really so. Quick to appreciate the comforts and advantages of railway travelling in these days, the educated and well-to-do people of this country have interested themselves greatly in all matters of railway administration. This branch of public affairs occupies their attention very largely and they are continually asking for the extension and improvement of the railway system throughout the country. The numerous questions in the Legislative Councils show how keenly the shortcomings of the railway are scrutinised all over India. It is not strange then that the railway arrangements during the festivals at places of pilgrimage should come in for a good deal of adverse comment. The trains are crowded to their utmost ; often there is no seat to be found ; it is very difficult to get a ticket ; trains are frequently delayed ; food and water are not readily procurable : the discomforts are too well known to every one to need detailed enumeration. The educated passenger finds that travelling at the time of a great religious festival is a very different thing from an ordinary railway journey. His acquaintance with the railway, however, is too short for him to understand that much of this discomfort is unavoidable and that, go where you will in the world, wherever there is a rush of travellers there will, and must, be similar discomforts. Railways are new and it is not as fully realised in this country as elsewhere that at times the rush and the overcrowding are inevitable. The Indian has a trusting belief that he has but to make a complaint and someone will find the remedy. What that remedy is, how it is to be obtained, or by whom, or whether there is a practical remedy at all, are questions that do not worry him. Enough for him that he knows at ordinary times he travels in comfort ; it must be some one's fault if he is put to discomfort on any other occasion.

But it is not only the educated or well-to-do who complain. The patient villager is slow to voice his grievances but will, if questioned, likewise add his protest against the railway arrangements. The same villager who will submit cheerfully to any overcrowding in his panda's house, to any sort of shelter at the fair, to any crushing or weary waiting at the temple door, to any exactions from his priest, reserves his grumble for the railway. This seems strange but is largely due to the newness of the railways : it has always been his experience that fairs are crowded and priests greedy but that railways are generally comfortable ; his acquaintance with the latter is too short for him to understand that there are times when lapses from the normal must be expected.

From our inquiries two facts stand out. The first is that there is widespread dissatisfaction with the present arrangements made by the railways for pilgrim traffic. The second is that, while some of the discomfort is due to removable causes, much is also unavoidable and the complaints to that extent unreasonable. It is the purpose of this part of the report to suggest how improvements may, in our opinion, be effected. We shall deal first with the two chief

grievances—lack of an adequate supply of fresh drinking water *en route* and the use of goods wagons for the carriage of passengers. There are other defects in the railway arrangements for the transport of pilgrims some of which are of greater importance than these from the point of view of public health and distribution of disease ; they will be taken up in turn later and appropriate remedies suggested.

B.—WATER SUPPLY *en route*.

43. The arrangements at present made for the supply of drinking water to the travelling public are more or less the same on every railway. Water is procurable

Water supply at ordinary times. at the stations only. For passengers entraining or detraining there is a well at practically every station where it is possible to have one, and each person draws his own supply. For the convenience of travellers in the train Hindu watermen and Muhammadan bhishtis are provided at the smaller stations at frequent intervals and at many of the larger stations these arrangements are supplemented, where a suitable supply of water is obtainable, by standposts from which the passengers can draw water as required. In almost every case the water supplied is good to drink and palatable : where it is not so, it is due to the fact that there is no good water to be had in the neighbourhood. In a few places, wells may need to be built, and occasionally the water may not be sufficiently protected from the possibility of contamination, but our experience was that, practically everywhere, the drinking water was of good quality and the supply adequate, on the whole, for ordinary times. One point, however, requires notice. At those stations where there is a water supply laid on in pipes the hydrants are usually too few in number and too far apart, so that the passengers have to go a long way from their compartments to get water. This is a serious disadvantage and much intensified by the dilatory habits of the Indian traveller. The passenger who gets first to the standpost is not satisfied with a drink, he wants to wash his mouth and clean his teeth, to wash and fill his lota and, if possible, complete his toilet by washing himself if not his clothes. In any other country the other passengers would quickly interfere and settle this difficulty for themselves but in India caste habits and the general customs of the people prevent so easy a solution. We would recommend that the number of hydrants be increased to at least one every hundred feet along the platform or that others of a T. shape and fitted with more than one tap be substituted for the present single-tap type. Tanks with a series of taps offer some advantages if they are built of masonry and protected by a roof : they, however take up a lot of room on the platform.

44. During the chief festivals at the "places of pilgrimage", and indeed whenever there is any special rush of

Water supply—special arrangements for melas defective. traffic, the arrangements for water supply described above are usually supplemented by the employment of a few extra water-

men. That this is altogether inadequate no one can doubt who has ever watched a pilgrim special. These trains have to give way to the ordinary trains, delays are inevitable and halts are often long. The journey is usually a tedious and hot one, at times in an iron goods-wagon, and water, plenty of it and fresh, is of the greatest importance to the pilgrim in the crowded train. But it is rare for him to get as much as he needs as it is quite impossible as a rule for the staff of watermen to comply with more than a small fraction of the requests showered on them by the thirsty pilgrims.

45. In searching for a remedy for this defect it must be remembered that

Water supply—pilgrims unable to go to stand posts. pilgrim trains are invariably crowded. Every carriage and wagon is filled to its utmost, and on the busiest days there are generally a good many passengers left at each

railway station for whom there is no room. Having once got his seat the pilgrim must keep it at all costs. Although the train may halt for a long time at a station he cannot get out to fill his lota : if he did so his place would immediately be taken by someone else, and he would probably find it impossible to get back to his own party in his own carriage and often would be unable to find a place anywhere in the train at all. The fear of being separated from his companions

or left behind is always before him : and as a result he naturally refuses to move from his seat until he has reached his destination. In the goods-wagon with the lower half of the door fastened up it is difficult for the pilgrim to get out and in during the halt at a station even if he wished ; for the old and feeble it is impossible. It follows then that standposts on the platform are of little use to the pilgrim in the train and cannot give him the water he wants and needs : if he is to be supplied with water on his journey it must be given to him where he is in his carriage or wagon.

46. The railway administrations have attempted to meet the difficulty we have described by appointing a few extra temporary assistants to supplement the ordinary staff of watermen at mela times.

Water supply—hand service from buckets too slow.

The doling out of water from buckets, however, is a slow and tedious process and even with the best and keenest of staff, which the temporary watermen are not, it would be impossible to satisfy the wants of a large train containing from 1,200 to 1,500 pilgrims in anything like a reasonable time. In practice the watermen cannot supply a tithe of the water required and we have been forced to the conclusion that this system will always be inefficient.

47. The apparently obvious solution of the difficulty is to carry water with the train. We have considered many suggestions to this end but have reluctantly

Water supply—impracticability of carrying water in the trains. come to the conclusion that none of them are practical. They are all modifications of, and may be considered under, two main proposals :—(a) that there should be attached to each train a special water truck fitted with taps, and (b) that each carriage should be provided with its own water tank.

The first must be rejected because the water would often become so hot as to be hardly drinkable. In any case it could only be used when the train came to a standstill and here again we are faced with the difficulty of distribution. Such a scheme would be of no real use : it has all the disadvantages of standposts and more, and would provide a much less palatable water.

The second proposal, that each carriage or wagon should carry its own water supply, appears a simple and easy solution but unfortunately there would be very considerable difficulties in the way were an attempt made to give effect to it in practice. Removable water tanks could be fitted near the doors inside goods-wagons, when these are used for the carriage of pilgrims, but to prevent accidents the tanks would have to be firmly fixed. As the wagons used are not always the same but are collected as available all goods-wagons would, in practice, have to be adapted for this purpose. Only very simple alterations, however, would be required and the cost would not be excessive. Much more serious drawbacks would be the great waste of water which would certainly occur and the difficulty of keeping the tanks filled : the floor of the wagon would probably also soon become very wet and dirty. The East Indian and Great Indian Peninsula Railway Administrations have tried various expedients for giving their own water supply to third class carriages, but in both cases with little success. The water if carried in a tank on the roof of the carriage quickly becomes hot and unpalatable : with a tank in this position the waste also is excessive. Carried underneath the carriage the water would be kept cooler and, being obtainable only by pumping, would be less likely to be wasted. The East Indian Railway, however, has tried this system with first and second class carriages and found it unworkable owing to the difficulty of keeping the pumps in order : in a third class carriage its chances of success would be much less. Moreover, we understand that there are great structural difficulties in having the water tank in this position owing to the amount of brake rigging, gas fittings, etc., which already exist beneath the carriage. We have carefully considered this question in all its bearings and are satisfied that, for the present at least, the provision of a drinking water supply in each carriage and wagon not only bristles with difficulties but would also be very costly : in addition it would be much less appreciated by the passengers than the fresh cooler platform supply.

48. We have seen that it is impossible to expect the pilgrims to leave their seats in the carriages or wagons and go to

Water supply - distribution by hose pipes at special stations recommended. the hydrants for water, also that in practice sufficient drinking water cannot be given by means of watermen and that there are

serious objections to providing each carriage or wagon with its own supply. The question remains how is this very real grievance, the lack of sufficient drinking water for the pilgrims while in the train, to be remedied. In our opinion the best solution is to be found by greater concentration of effort and the provision of a full supply at particular stations. We would suggest for this purpose the stations where engines stop to take up water. Here there is always an overhead water tank from which an auxiliary pipe could be run along the platform in its full length. Connected with this there should be no great difficulty in providing a number of hydrants fitted for coupling a hose pipe to them. On the arrival of a train one or more flexible hoses, fitted with long nozzles and spring cocks, would be attached to the hydrants by a special staff and water would be given from door to door along the train. In this way water could be readily and quickly distributed to every passenger within the period of halt necessary for watering the engine and no extra delay would occur.

Practically all railway officials are agreed that further provision for the supply of water is necessary and that the present arrangements require amplification. The plan we suggest is practicable and if it is adopted an adequate supply of fresh drinking water is assured to every pilgrim at the watering stations. This would suffice for all needs. Watering stations are not very far apart and, as from two to three hours at the most would elapse between any two, the supply obtained at one station would be ample for the requirements of the pilgrim until his arrival at the next. The arrangement would also be in the highest degree popular with the travelling public, inasmuch as, for the first time, every pilgrim would be able to get enough water throughout his journey. The plan has advantages for the railway administrations also. One man with a hose would be worth more than a dozen carrying water in buckets, as at present, and the employment of a large number of temporary watermen on the occasion of every fair or festival would no longer be necessary. With the provision of an ample supply of water at the watering stations, special arrangements at the smaller intermediate stations would also no longer be required even in the hot weather. The abolition of this temporary staff and the saving in delay to traffic would, we think, compensate the railway administrations for the extra expense incurred in laying down the hydrants and providing the hose pipes. Even if the plan proposed should entail a little more expense to the railways, however, that expense would be well incurred in the removal of a very real grievance of the pilgrims.

C.—USE OF GOODS-WAGONS FOR PILGRIM TRAFFIC.

49. To provide for the increased passenger traffic which occurs at *mela* times goods-wagons are largely used as passenger carriages by most of the railways in

Goods-wagons—sanitary objections. India ; it is the custom in fact for pilgrim specials to be made up wholly or almost wholly of these vehicles. This is regarded as a serious hardship by most of the pilgrim passengers and the grievance was brought forward with peculiar persistence by practically every witness examined. We were unable to inquire fully into all the allegations made, as the practice of using goods-wagons in the pilgrim traffic has been almost wholly abandoned by the East Indian Railway and the Bengal-Nagpur Railway are making efforts in the same direction. From a sanitary point of view, however, the use of goods-wagons for the transport of pilgrims is open to several objections, of which the chief are :

- (1) the liability to overcrowding and increased danger of infection by diseases such as cholera ;
- (2) the extremes of temperature to which the pilgrims are subjected during the day and night ;
- (3) the defective ventilation ; and
- (4) the absence of any latrine accommodation.

50. In the goods-wagons overcrowding is frequently excessive and even after

Goods-wagons—overcrowding and increased danger of infection.

the pilgrims appear to be packed as tightly as possible a few extra passengers are generally squeezed in. In the ordinary passenger carriage, on the other hand, this is

prevented to a great extent by the partitions and seats. The dangers which attend overcrowding can be easily realised in the case of one of the passengers being taken ill of cholera as not infrequently happens. All are sitting on the floor which must necessarily be fouled with the patient's dejecta : for those near the patient to escape having their clothes grossly contaminated is impossible. In the passenger carriage under similar circumstances the dejecta would pass to the floor and the passengers would naturally betake themselves to the seats and so avoid pollution. In practice the three facts, that overcrowding is limited, that seats are provided and that the partitions divide the passengers into blocks, reduce the danger of infection in the ordinary passenger carriage very considerably. Further, in the event of contacts having to be detained for disinfection, this has to be done for a very much smaller number of people.

It was suggested to us that the tendency to overcrowding would be checked, the danger of infection lessened, and the general comfort of the pilgrims increased, were the wagons provided with benches. There are, however, many obvious disadvantages from having benches in goods wagons and these we think would more than counterbalance any benefits likely to be gained : in addition the expense and delay due to fitting the benches would be considerable. It was also suggested that all wagons likely to be used for pilgrim traffic should be examined and marked, according to their size, construction and ventilation, for a maximum number of passengers, as is done in the case of ordinary carriages. This procedure, we consider, might be useful in drawing the attention of traffic officials to the types of wagon most suited for carrying passengers but as a preventative of overcrowding would do little good. We are satisfied that there is no real practical remedy for this defect. The crowds waiting for the trains are often huge and the railway officials are naturally anxious to see them off as quickly as possible : every vehicle therefore leaves packed to the utmost while there are any pilgrims left to go. Goods wagons lend themselves specially to overcrowding and so long as they are used for the pilgrim traffic this defect will necessarily occur. Its two most objectionable results, however, the spread of infection and the hot foul atmosphere, can be to some extent mitigated by efficient medical inspection of the passengers and by improved ventilation : the measures which we consider necessary under these two heads are discussed below under medical arrangements and ventilation respectively.

51. The second disadvantage appertaining to goods-wagons is that, being in most cases built wholly of iron, they be-

Goods-wagons—extremes of heat and cold.

come excessively hot in the day and, especially during the winter months, become bitterly cold at night. To pilgrims

who for some days previously have been having irregular and unaccustomed food, these variations of temperature are liable to excite intestinal trouble and light up old and chronic dysenteries and diarrhoeas.

Wagons built of wood keep a much more equable temperature than those made of iron and are to that extent better suited for passenger traffic. They should therefore be selected for this work whenever available if they are suitable in other respects. In iron wagons also the heat of the floors by day and the cold at night could be somewhat tempered by having the floors boarded. Boarded floors, it is true, quickly become worn and rough and are then less easy to clean thoroughly but with a little attention this should not be a serious difficulty.

52. The third disadvantage is insufficient ventilation. The ordinary passenger carriage is so constructed that, however crowded it may be, ample ventilation is

Goods-wagons—defective ventilation.

always ensured by the numerous doors and windows. It is not so with the goods-

wagon. For the transport of pilgrims, wagons are collected as they may be

available and many different sizes and sorts are brought into use : the majority are ventilated in one way or another but seldom sufficiently. The ventilators, where they exist, are generally small openings of a jhilmil pattern and covered inside with fine-meshed wire gauze or simple gauze covered openings either free or provided with flap or sliding shutters of various patterns : in some cases there is a round manhole at either end of the wagon on opposite sides near floor level. In practice the sliding shutters are often closed and extremely difficult to open : the manholes too are often shut or are stopped up by the unlucky pilgrims sitting next to them. Such openings can, of course, afford access to but little air : fortunately the pilgrims are not wholly dependent on them. Whenever a wagon is used for the carriage of passengers the upper doors on both sides are left open, and this affords plenty of air for the middle of the vehicle. There is no through draught, however, even in those with a man-hole at each end, and in the corners, when, as is usually the case, the wagon is packed full, the air must become foul and overheated. As a matter of fact the trucks used for carrying cattle are much better provided with ventilation than those generally used in the pilgrim traffic.

A good deal could be done to remedy this defect of ventilation by more careful selection of the wagons to be used. It is apparently the custom on some of the railways to take any wagons that may be available without much regard to their suitability for the work. Long bogie goods wagons are obviously very defective in ventilation and for this reason alone should never be used for pilgrim traffic. Their use must be expensive also for the railways as a bogie wagon relatively to its size can carry a much smaller number of passengers than a four-wheeler. In fact the shorter the wagon the greater as a rule is the advantage both to the pilgrims and to the railway.

Selection of wagons, however, can never afford anything like a complete remedy for this defect. Practically all goods-wagons are badly ventilated and certain structural alterations would be necessary before they could be considered at all suitable for passenger traffic. It is true that they are primarily constructed for the carriage of goods and for this purpose they must be thoroughly well protected from the possibility of fire or theft : they must be so built that when closed neither will sparks from the engine be able to set fire to their contents even if they are of such an inflammable nature as cotton, nor will a thief be able to tamper with goods in transit. Neither of these conditions, however, is incompatible with thorough and ample ventilation : all that is necessary for the latter is the provision of more, or much larger, ventilators of one or other of the better types already in use, and which should be more judiciously placed. Of the common forms of ventilator the man-hole and flap-shutter types appear to be the best. All are, however, much too small and they should not be placed at floor level or close to the top of the wagon, as is now the custom, but in an intermediate position with their lower edges about 3 feet above the wagon floor. Their covers should also be arranged to fold right back and leave the whole of the ventilator opening quite free. They should be constructed in both ends of the wagon as in this position they give a much better through draught, and they should extend right across from side to side if possible. Other similar ventilators in the sides of the wagon would be appreciated by the pilgrims as windows but are not essential. We understand the Great Indian Peninsula Railway Administration is experimenting with a type of wagon fitted with drop-shutter ventilators in the sides. We were not able to see any of these but from the drawings and description we think they should prove a very great advance.

53. The next great sanitary objection to the use of wagons for carrying pilgrims is the absence of latrine accommodation. This is a serious matter as the journeys to be performed are often long and it is very difficult, as has been pointed

out above, for a passenger to leave his wagon any time *en route*. In this connection it must be remembered that many of the pilgrims are sufferers from chronic dysentery and diarrhoea which has probably been aggravated by chill, exposure, irregular meals and unaccustomed, and often bad, food. There can be no doubt but that the difficulty of getting access to latrines is a real and definite hardship to the pilgrims while travelling in these wagons.

Any attempt to provide latrines in the goods wagons would raise almost insuperable difficulties: the structural changes required would be both difficult and costly and as it is impossible to tell beforehand which wagons would be available and likely to be used, the alterations would have to be made in a number of wagons out of all proportion to those actually required. Moreover, such latrines would afford but little privacy and would certainly be objectionable to the people who had to sit near them.

We have carefully considered the whole question of providing facilities for pilgrim passengers for the purposes of nature *en route* and are of opinion that this can be most cheaply, and at the same time most effectively, done by arranging for early morning and evening stoppages of all trains carrying pilgrims in goods wagons. This scheme is already in operation on the Great Indian Peninsula Railway and is said to work well. The halts should be made preferably at small wayside stations with few habitations but with a good water supply: a list of these should be prepared and the railway staff given orders to halt pilgrim trains at the nearest one for 40 minutes between 6 and 7 o'clock in the mornings and between 18 and 19 in the evenings. During the halt all wagon doors should be let down to facilitate egress and ingress. Latrines, even if erected, would not be used by the majority of the pilgrims who prefer the open country; no special latrines need therefore be made: an enclosure for women is all that would be required besides the sweepers to clean up the ground and trench the filth afterwards.

Better use might also be made of other stoppages during the day. Pilgrim trains are frequently required to halt at wayside stations to allow mail or other fast trains to pass. In such cases the pilgrims appear rarely to be informed of the length of the stop, but if this were done by the guards of the trains much of the inconvenience due to want of opportunity of relieving nature might be easily avoided. It could not, however, fully take the place of the regular morning and evening stoppages already recommended.

54. Besides the sanitary objections to the use of ordinary goods wagons for carrying pilgrims to which we have just referred several others, on more general grounds, were constantly brought to our attention.

Perhaps the most common was that the wagons are usually dirty. Wagons that have been used for the transport of coal are brought into service with half an inch or more of coal-dust still lying on the floor. The damage this does to holiday attire, to say nothing of comfort and health, naturally impresses itself on the mind of the passenger. Similarly, a wagon carpeted with small sharp bits of kankar, or coated with a sticky mass of gur, or sprinkled with the dust of powdered chillies, hardly makes for a comfortable journey. There is also the possibility of returning from a holy pilgrimage in a wagon recently used for the carriage of bones or hides. The complaint regarding the dirtiness of goods-wagons was general. It was not borne out at our inspections of the wagons on the Bengal-Nagpur Railway which were all found clean and in good order but we have good evidence to show that it is quite well founded as a general rule.

The removal of this defect, where it exists, is solely a matter of better organisation. We would suggest that officers should be detailed by name and held personally responsible that the wagons are collected in good time and that after collection they are properly cleaned for the reception of passengers. It is of the first importance that this preparation should be done in good time: as once the rush of a fair has begun there is no time to see that wagons are properly cleaned. By fixing responsibility on individual officers the administration would be better able to see that its instructions were carried out.

Orders are issued by the railways that wagons which have been used for the carriage of goods specially abhorrent to Hindus, such as bones, hides, etc., should not be used in the pilgrim traffic. To avoid any possibility of mistake, however, we would recommend that these wagons be given a distinctive and easily recognised mark.

Another objection is the difficulty of getting into, and out of, the wagons. **Difficulty of ingress and egress.** For the old, the weak and the infirm this is a serious drawback but it is one which cannot be avoided so long as wagons are used. The lower flap of the door must

be fastened up securely for many would be sure to be injured if the pilgrims were able to open it themselves. If it were let down at every station *en route* by the railway servants much delay would occur.

It is also a grievance that, unlike the ordinary passenger carriages, goods wagons are not usually furnished with lights. The reason given by the railways

for this omission is that when lamps are provided they are usually stolen either by the pilgrims or, more probably, by their own menial staff. It seems to us that a method of fixing the lamps so as to prevent such thefts could be easily arranged. It is certainly a hardship to have to pass the night in crowded wagons in complete darkness.

Another objection is the jolting to which the passengers are subjected in the wagon. Every sudden start or stop, at stations, or during shunting, throws each

passenger against his neighbour in a wave from one end of the wagon to the other. There are no partitions to prevent this as in the case of the ordinary carriages.

Lastly, there is what may be termed the sentimental objection. Having taken tickets for a passenger train the pilgrims dislike being carried in vehicles constructed for the transport of animals or merchandise: not only do they think they are being deprived of a right they have paid for and which is therefore their due, they consider that they are being subjected to indignity. This may not sound a very serious complaint, but of its real existence, especially amongst the better educated classes, there can be no doubt: it is a grievance that grows daily and one that merits sympathetic consideration.

55. The defects both sanitary and general which we have enumerated are sufficient to demonstrate the undesirability of using goods wagons for the transport of pilgrims: but the question remains whether it is possible to do without them. To

Goods-wagons—Possibility of doing without. this an answer is usually given in the negative. It is pointed out that the larger

fairs and festivals occur rarely in the year, the rushes of traffic though frequently very big are uncertain in size and last for short periods only, and the train runs are long, so that very large additional passenger rolling stock would be required to carry all the pilgrims, and this extra stock would have to lie idle for the greater part of the year: in these circumstances it would obviously be unsound economically for each of the railways to provide such an amount of rolling stock as would be necessary, and they could not be expected to do so. There is a great deal of force in this contention, but with the example of the East Indian Railway before us we are not convinced that the difficulties are wholly insurmountable. This railway has very large and important "fairs" and "places of pilgrimage" on its line and yet, with rare exceptions, has almost dispensed with the use of goods wagons, and carries nearly all its pilgrims in ordinary passenger carriages. That it should be able to do so is due, we understand, partly to the fact that being a large and important line its mela traffic is not so great in proportion to the ordinary everyday traffic as is the case with some of the other railways, but chiefly, to the facts that it has been fortunate in being able to obtain the passenger rolling stock it requires for its everyday traffic and that it borrows from other railways when more is necessary. The example this railway has set, we should like to see followed by the others. To do so three conditions are apparently necessary—an adequate amount of rolling stock for the regular everyday passenger traffic, facilities for borrowing extra stock when necessary, and an extensive line. Of these conditions, however, it is the first which is the all important one and the two others are really dependant on it. Without adequate stock for ordinary requirements any general policy of lending and borrowing is impossible: on the other hand if such a supply is granted it is all to the advantage of the railway possessing it to lend as often as any can be spared. Further, were a policy of lending and borrowing freely initiated, each line would in practice virtually become an extensive one and the extra carriages required for any particular mela would be few in proportion to the vast stock of all the railways from which they might be borrowed. The mela traffic too, which at present is spasmodic and occasional for each railway, would, by

a summation of melas over very wide areas, become in effect regular traffic all the year round. Large increases of the passenger rolling stock of each railway which would be extra to that ordinarily required, and would therefore lie idle for long periods between melas, does not seem to be necessary. All that appears to be needed to bring about conditions which would make it possible to stop the use of goods-wagons for the pilgrim traffic, to a very large extent if not altogether, is an increase of the passenger rolling stock of the different railways to the full amount required for their ordinary everyday traffic and we would suggest that steps be taken to have this done. There can be no doubt as to the advantages which would accrue both from the point of view of public health and also in removing a very real cause of discontent amongst the pilgrims generally.

In making this suggestion we fully recognise that a railway, especially during development, has many calls on its resources, that funds must be allotted strictly in accordance with the relative importance of these, and that schemes desirable in themselves, or sometimes even urgent improvements, have to be postponed frequently for want of money. Whether money can, or should, be given for an increase of the passenger rolling stock as suggested we are not in a position to give any opinion but we would urge, both on grounds of public health and also because of the dissatisfaction which the use of wagons for pilgrim traffic is causing throughout India, that the necessary funds should not be refused until the whole matter has received the fullest consideration. In this connection we would point out that the present practice of using wagons is in itself expensive for the railways : the actual rush of traffic for a festival may last for only a few days, but the wagons have to be collected well before the festival begins, and have to be redistributed after it is over, and for the whole of this disproportionately long period they are withdrawn from their proper use as carriers of goods.

56. If, however, this plan of borrowing and lending rolling stock for any cause should prove not to be feasible, or pending its general introduction, much can, and should, be done to remove the more objectionable conditions in which the

Goods-wagons-improvements required if they are used. pilgrims are now carried in goods wagons. What these conditions are and how those which are removable may be most easily got rid of we have pointed out above. The improvements we have suggested are not sufficient to remove all the grievances but they will go far in that direction. It must be admitted that the pilgrims are entitled to better treatment than they now receive : they are a source of substantial income to the railways and part at least of this should, in our opinion, be devoted to ensuring that they will travel without detriment to health and in reasonable comfort.

57. In connection with the use of goods wagons there is one more point to which it is necessary to refer. An idea is widely prevalent among pilgrims that if the railways are unable to provide passenger carriages for them they should carry them at a lower rate, in other words if they are forced to travel by goods-wagons they should be charged only a fourth class fare. We can see nothing in favour of this proposal. In the first place it would be impossible to foretell which of the pilgrims would find accommodation in the ordinary carriages and which of them would be compelled to travel in the goods-wagons. This of itself is enough to make the proposal unworkable. Moreover, although the pilgrims may complain bitterly about the discomforts of travelling in a goods-wagon there is no doubt that if they were given the option of travelling at the ordinary fare in a passenger carriage or at a lower rate in a goods-wagon the majority would unhesitatingly select the latter. Our object is to try to improve the sanitary conditions under which pilgrims travel and we must therefore oppose any change which would encourage them to desert the ordinary carriages in favour of the goods-wagons. Lastly, the third class fares are already very low and the railways could never be expected to consent to a rate lower than that now charged.

D.—FOOD SUPPLY *en route*.

58. Food can be procured by the pilgrim *en route* at all the more important stations ; it is in fact for sale wherever **Food supply—At stations.** there is likely to be a market for it. Our experience assures us that the supply is equal to the demand as, even on the most

crowded festival days, there was everywhere enough and to spare. The quality too is, on the whole, good. At times the food may be somewhat stale and, as the pilgrim will not pay too high a price, the materials used are naturally not always of the best quality ; as a rule, however, the foodstuffs were considerably better than what we saw being sold in the bazars.

The responsibility of seeing that the food offered for sale is fresh and wholesome rests, in practice, chiefly with the station master, but gazetted officers also inspect the food as opportunity offers. This practice appears to work satisfactorily and we do not consider any change necessary.

59. The right to sell food on the platforms and within the station compounds is given on contract by the railways, but the

Food supply--Method of giving con-tracts. system in force varies considerably under the different administrations. In some cases the right to sell is put up to auction.

This we consider undesirable as the natural result is a tendency for the contractor to provide inferior foodstuffs at high prices. It is true that many railway administrations insist on certain tariff rates being observed, but anyone who has seen food bought and sold at railway stations will understand how difficult it must be to enforce such a rule. On other railways contracts are given free, or for fixed sums, to respectable contractors. Of the various systems in vogue that of the East Indian Railway appears to us the best and we would recommend it for general adoption. On this railway the custom of auctioning shops has been discontinued since 1903 and each vendor is now charged a fixed monthly fee varying from 8 annas to Rs. 10 according to the articles that are sold. In addition he has to deposit with the railway a sum varying from Rs. 10 to Rs. 100 as good conduct money. A regularly stamped agreement, of which a copy is attached as Appendix XXVII, is drawn up between the contractor and the railway company. Section 10 of the agreement lays down that the vendor is liable to pay a fine of Rs. 10 for having bad or stale articles of food, for short weight, for breach of tariff rates, for subletting his contract or for the absence of the salesman. This is a good and summary procedure and our inspections showed it to be effective.

At the larger stations some railways build shops which are let out to the food contractors at a low rental. This makes for clean and wholesome food and is a plan that might with advantage be adopted at all stations where there is much passenger traffic.

60. The contractor or his salesman hawks his wares along the platform from carriage to carriage. To catch the eye of

Food supply - Protection of food-stuffs. the passenger better the food is usually exposed in open trays which at night are lit up by smoky naked lights. By day

the food gets covered with flies and dust and by night with smuts from the lamp. To protect the food is clearly desirable. There has been some difficulty, however, in getting boxes and trays which, while protecting the foodstuffs from contamination, will at the same time meet the other requirements. The food must be plainly visible and easily got at, while the trays and boxes must be strong enough to stand fairly rough usage and yet not too expensive. Some of the railways have persisted in their experiments and their perseverance has been rewarded with a considerable amount of success so that there are now several devices which satisfy all the requirements. We would recommend that they be adopted generally. The Bombay, Baroda and Central India Railway insists on its contractors using closed lamps on their sweetmeat trays at night and this we think might be done on all railways. Of the various expedients for protecting food from dust and flies the sweetmeat tray introduced by the same railway appears to us to be the most useful. This tray is covered by a semi-spherical gauze dome divided into sections anyone of which can be opened separately. A sketch is attached as Appendix XXII. On the Great Indian Peninsula Railway similar trays are in use and also gauze covered counters for the shops. Sketches of these are shown in Appendices XXIII and XXIV and photographs in Appendix XXV. On the East Indian Railway glass covered trolleys which can be wheeled along the platform are also in use at some of the largest stations. These are somewhat expensive, and for this reason are not much in favour with the contractors but, when kept in repair, they protect the food from both flies and dust and are admirable in every way. A sketch is given in Appendix XXVI.

61. At the best, however, the cooked food that the Hindu pilgrim can procure at the railway stations must be

Food supply-Food in the train unsatisfactory.

unsatisfactory. The orthodox Hindu is by

religious custom very much restricted in

his diet when travelling. Bread, rice and

dal, which form the pilgrim's staple food when he is at home, can be eaten only where they have been cooked and are, therefore, practically forbidden to him during a journey by train. He has to content himself with what is usually termed "pucca" food, that is, puris, sweetmeats and vegetables cooked in ghee or oil, uncooked sattoo mixed with water, gur, milk and fruit. Such food is expensive and indigestible: the pilgrim is never able to get what he considers a really good meal and what little food he does buy usually disagrees with him. Indigestion is widely prevalent amongst the pilgrims and is the precursor of many other ailments. Were it possible for them to get at any time on a long journey a good substantial meal of the simple food they are accustomed to, not only would the innovation be extremely popular but it would have a most excellent effect on their general health.

62. From time to time during our tour it was suggested to us with the above object that pilgrim trains should be fitted

Food supply-Third class dining cars. with third class dining cars. These have been experimented with by the East Indian and the Bengal Nagpur Railways on

ordinary trains. By the former railway they have been abandoned, but we were able to see one belonging to the latter and we have little hesitation in saying that they would be of little use to the pilgrims. From the evidence before us it appears that orthodox pilgrims would be chary of using a dining car, and most pilgrims are orthodox. We have also seen that it is difficult, often to impossibility, for the pilgrim to leave his place in his carriage or wagon so that quite apart from any religious scruples he would hesitate to go to the dining car and once there and comfortably seated it would be still more difficult to get him to leave again on the off chance of finding a seat elsewhere in the crowded train. Moreover there would be other difficulties: the Indian passenger usually carries with him a heterogeneous collection of luggage, the food would necessarily be expensive, and the car would be able at best to accommodate only a very small proportion of the passengers in the train. This proposal to have third class dining cars has, in our opinion, little to recommend it and would be unlikely to prove useful in practice.

63. Another suggestion frequently made to us in the same connection was

Food supply-Halts for food. that each pilgrim special should be halted once during the day at some wayside

station sufficiently long to allow the pilgrims to cook their own food. Such halts, however, would have to be of from two to three hours duration and would be difficult to control. Serious delay and dislocation of traffic would almost certainly result and the proposal would be unworkable in practice.

64. We have considered this difficulty about food carefully as both the health

Food supply-Sarais at junctions. and comfort of the pilgrims are involved.

It appears to us that a simple and easy solution could be found in the construction of roomy sarais by the railways at their principal junction stations. Even with the best arrangements it is not always possible for one railway to run its pilgrim specials to suit those arriving from another. At the junctions these trains are often unavoidably held up, or the passengers turned out, for a long and tedious wait while the onward trains in different directions are being got ready. Such detentions are very naturally a cause of annoyance to the pilgrims but would be welcomed if the time could be utilized by them in bathing, cooking their food and resting in a comfortable sarai. There are waiting sheds at most of the junctions, it is true, but these are, as a rule, too small and do not supply the necessary conveniences. The sarais should be roomy and comfortable, should be well lighted at night, should have an ample water supply with suitable bathing accommodation and latrines, have separate sheds for cooking and resting, and have shops selling all the ordinary kinds of uncooked foodstuffs, firewood and earthen utensils for cooking. Generally, they would be open free of charge to the travelling public but a number of small rooms giving

more privacy might well be added for use on payment by the better class of passenger. An excellent sarai of the type we suggest has been built by the Bengal Nagpur Railway at Kharagpur Junction and we understand that not only has it proved very useful to the railway during pilgrim traffic but has also been much appreciated by the passengers. Drawings of this sarai are attached as Appendix XXVIII.

The idea is not a new one. Already large numbers of passengers break journey at the junctions or elsewhere in order to rest, bathe, cook their food and generally attend to other matters of their usual daily routine. That many more do not do so is due to the fact that the necessary conveniences are not at hand at most of the junctions. They have to be sought in the neighbouring town, and the vast majority of the pilgrims, much as they may desire to bathe and have a good simple meal, are as yet too little accustomed to railway travelling to have sufficient confidence to leave the immediate precincts of the railway station even during a halt of some hours. Our suggestion is that this should not be necessary but that the pilgrims should be able to procure all that they require on the railway premises where they run no risk of losing their train. They are very largely creatures of habit and slaves of a rigid daily routine, and this concession to their customs would certainly be much appreciated—the effect on their general health would also be good.

It is not, however, only to the pilgrims that these sarais would be an advantage : they would be useful to the railways also, as we shall see later, in simplifying booking, the detection of sickness, etc., and would greatly facilitate the general traffic arrangements whenever there was any special stress. The junctions are the natural points for sorting out the passengers according to the direction in which they have to proceed and large accumulations of pilgrims frequently occur. At such times instead of having a discontented and impatient crowd thronging the platform or its entrances, as often happens, one or more train-loads of passengers could be drafted into the sarai according to its size where, happy and contented, they would remain out of the way but at once available so soon as the on-going trains could be got ready.

E.—CONSERVANCY *en route.*

65. We have already shown the necessity of latrine accommodation for pilgrims travelling by train and suggested a remedy for the present difficulties when goods-wagons are being used. In the case of the ordinary third class carriages the difficulties though present are not so great. It is true that the carriages used for pilgrim traffic are as a rule the oldest, and that few of them are fitted with latrines. The ordinary carriage, however, has doors so that it is easier for the passenger to get out and in and the platform latrines are so much the more accessible. All new third class carriages too, except those for suburban and short branch line traffic, are being fitted with latrines. As every year new carriages are built and the oldest become unserviceable all trains will gradually come to be composed of rolling stock so fitted. In time the defect will be remedied but meanwhile we would recommend that pilgrim trains composed of third class carriages should be halted morning and evening in the same way as we have suggested for those made up of goods wagons.

In this connection it should be noted that, quite apart from the expense, the provision of latrines in third class carriages is not without its difficulties from the point of view of the railway administrations. One of these is that the permanent way is fouled, and the difficulty of getting a suitable class of men to work on it is becoming steadily greater. Another objection is that the latrines are very largely used when the trains are at a standstill with consequent pollution of the line and serious nuisance in those stations where the train stops in the early morning and in the evening. The only way to prevent this fouling of the line would be to receive all excreta passed in the latrines in the train in receptacles under the carriages and to have these carried on to selected stations where they could be emptied and cleaned. In practice the difficulties would be very great. A much more hopeful though less complete solution of the difficulty is to be found in the construction of

pilgrim sarais at the chief junction stations as already suggested for other reasons. Were these available most of the pilgrims and other passengers would attend to the calls of nature before entraining and much mitigation of the present nuisance on the line would result.

F.—ARRIVAL AND DEPARTURE OF PILGRIMS.

66. So far we have considered only the conditions affecting the pilgrims *en route*: it is necessary to examine also the **Arrival and departure—General.** special arrangements which are called for against their arrival and departure at the mela stations. During our tour we were unfortunate in not having an opportunity of watching pilgrims arriving and departing in any large numbers except at Puri during the Rath Jatra, and even then the crowds were smaller than usual. This part of our report therefore deals partly with our own actual experience of the conditions existing but to a greater extent expresses the views formed by us after discussion with others.

So soon as the pilgrims arrive at their destination they hurry out of the train as fast as possible and leave the railway premises at once. Their arrival too is usually spread over several days and even at the important festivals large crowds never tend to form around the railway station. There is little danger to be anticipated from the arrival of the pilgrims therefore and the special arrangements necessary at this time are of comparatively little consequence. The conditions at the time of departure are very different. However great the crowd of pilgrims at the mela may be, they one and all wish to depart immediately the festival is over. The result is that practically the whole body of pilgrims going by rail crowds down to the railway station within one or two days. When it is remembered how vast a multitude assembles at many of these festivals—a quarter of a million was the estimated attendance of pilgrims at the Rath Jatra in Puri in 1912—it is obvious that no railway or railways can possibly carry off all the pilgrims as they collect. They throng round the railway station and every hour's detention means a greater fouling of the whole area with grave risk of an outbreak of disease. As we have seen many of these pilgrims have, for the whole period of the mela, been living on unusual food often of poor quality not seldom insufficiently cooked and taken at irregular hours: many will have been exposed to the cold at night or been huddled in overcrowded and ill-ventilated houses: most will be overtired. All these are predisposing causes to the outbreak of an epidemic. This danger is present throughout a festival, and the efforts of all the staff are continuously directed towards minimising it as far as possible. But it is in the precincts of the railway station at the time of departure that the greatest attention is needed for by that time the health of the weaker pilgrims has often been undermined and their power of resisting disease weakened, while in the dense crowd sanitary control and the detection of sickness have become most difficult. Anything that helps to get the pilgrims away quickly is of the highest importance from the point of view of public health. Every endeavour should, therefore, be made to reduce the time of detention at the railway station and to ensure that that time should be passed in as good and clean surroundings as possible.

67. One of the most common causes of disorder and dense crowding at mela railway stations is the delay that occurs in booking. Nearly every pilgrim has to take out a fresh ticket for the return journey and this is often a matter of

Departure of Pilgrims—Booking arrangements. great difficulty. Even at ordinary times a long and tedious wait is the rule: when the number of passengers is increased by a festival the delay is frequently exasperating and the pilgrims, fearful of losing their trains, usually collect round the booking offices in what can only be described as seething struggling mobs. To get their tickets the pilgrims must come early to the station.

The difficulties due to delay in booking can be fully overcome only by providing extra staff and booking offices proportionate to the rush of traffic expected; apparently this is usually done; but there are several other measures by which the disorder and confusion might be much mitigated. These are (a) the selection of better sites for the booking offices, (b) a better arrangement of barriers at the ticket windows, (c) continuous booking, (d) full booking at all ticket windows, (e)

the limitation of foreign booking, (f) the encouragement of return booking and (g) the presence of one or more money-changers in the station compound.

(a) A common arrangement of the station buildings is in the form of a double block with a covered passage between. The passage serves both as an entrance to, and exit from, the platform and, for the control of traffic, is closed at one end by a barrier and gate. In the *cul de sac* thus formed is placed the ticket window of the booking office. The general plan is shown diagrammatically in Appendix XXIX. For small wayside stations with little passenger traffic this situation for the ticket window is quite satisfactory and meets all requirements but it is obviously very defective wherever heavy rushes of traffic may be expected.

Two other frequent positions for the booking office are inside, or at the entrance to, the waiting shed. Either position is much better than that first described but is again unsuitable where the number of passengers to be dealt with is large. If the ticket window is inside the waiting shed the latter cannot be partitioned off into pens for the separation of passengers going in different directions and this, as we shall see later, is important. If on the other hand it is placed at the entrance to the shed it becomes impossible for one man to procure tickets for a whole party: not only is the crowd round the ticket office increased but all, including women and children, have to pass through the crush.

From the different arrangements inspected and the evidence before us we are convinced that wherever large numbers of passengers have to be dealt with, the booking offices should be placed at some little distance from each other so as to divide and break up the crowd and should be separate from the other station buildings to allow of free access to them by passengers wishing to purchase tickets and easy withdrawal so soon as the tickets are obtained. The booking offices may be within the railway compound or on the approach road to the station but there is a marked advantage at the larger festivals in having one also in the town or on the fair ground in some prominent position where it can be readily seen by all the pilgrims. This is the practice on the East Indian Railway and has been found to work well. Every ticket taken before arrival relieves the pressure on the station booking offices. Incidentally the pilgrim is able to take his ticket at his leisure and, having plenty of time to count and check his change, is much less likely to be overcharged, a species of fraud for which the crowded booking offices at the railway station afford ideal facilities. From the point of view of the railways these booking offices in the towns or on the fair grounds have some slight disadvantages. It is not always easy to obtain a good open site, and there may be difficulties in safeguarding and transporting the cash: there is also the additional expense of rent and of the extra staff. But the benefits accruing to the public from these offices are undeniable and they should be opened on the occasion of all large festivals: in the case of the larger and more important places of pilgrimage like Gaya and Puri we would also recommend that they be made permanent.

(b) Very frequently railway administrations attempt to dispense with the use of barriers to guide the stream of traffic at their booking offices or have only

Better use of barriers. a bar in front of the window, the passengers being expected to pass in on one side and out at the other. The pilgrims, however, do not understand the advantages of going in an orderly *queue* and when the crowd is large even the police are unable to marshal them into any kind of order. They push forward from all directions and each individual has to force his way to the front by elbowing and jostling his neighbours: having arrived at the window and obtained his ticket he has to fight his way out again. The utmost confusion prevails and the weak and old are helpless and must wait indefinitely. By increasing the number of booking offices and placing them some little distance apart so as to divide the crowd, as suggested in the previous paragraph, the confusion and disorder can be lessened, but barriers to direct the stream of traffic are also required. The best type we saw was that in use on the East Indian Railway of which a sketch is

given in Appendix XXX and a detailed drawing in Appendix XXXI. The advantage of this form of barrier is that there is no necessity for forming a *queue* but the crowd can press in from all sides.

(c) At most railway stations intermittent booking is the rule and the office is not opened till shortly before the time the train is due to leave. When this practice is

Continuous booking. continued at mela time large crowds very frequently collect before booking starts and all the troubles around the booking office are magnified manifold. During all important festivals the booking should be continuous so long as the rush lasts, and at the smaller fairs should start so soon as the passengers begin to collect within the railway compound. Not only is the booking facilitated but the crowds of pilgrims, always restless until they have booked, at once settle down patiently to wait for their train so soon as they have provided themselves with tickets.

(d) With the object of facilitating booking during rushes some railways

Full booking at all ticket windows. arrange to have separate booking offices for the stations on different routes. In theory the system should be good but it does not work out so in practice. The vast majority of the pilgrims are unable to read and to direct them where to go, it is necessary to have the different booking offices distinguished by flags or lamps and bellmen to call out the stations for which tickets may be obtained at each. Constant mistakes occur and too often the pilgrim after squeezing his way to a ticket window finds that it is the wrong one. He is unwilling to accept defeat and his protests only serve to delay himself and his impatient neighbours still further. We would recommend that with the limitations noted below tickets should be available for all places at each ticket window.

(e) It is the custom to book passengers through to stations on foreign lines. For most of these stations there

Limitation of foreign bookings. are no printed tickets nor is the fare given in the list with the booking clerk. Each ticket therefore necessitates a reference to the fare tables of the different railways concerned to find out the total charge which should be made and then the ticket has to be made out by hand. The booking clerk is responsible that the correct price has been charged and, even with hundreds waiting to be booked, each item of the calculation is carefully and laboriously checked and rechecked. This procedure results in most aggravating delays which could easily be avoided if during festival times foreign bookings at the mela stations were made to those stations only for which printed tickets had been provided : for other foreign stations tickets would be given to the nearest foreign junction on the route. At these junctions we have recommended that sarais should be constructed and there the pilgrims would be able to book for the onward journey in comfort.

(f) While many of the people who throng to the chief places of pilgrimage and festivals in this province are regular

Return tickets. pilgrims doing a round of visits to the sacred shrines, many also come direct from their homes and go straight back again as soon as the festival is over. To the latter return tickets would be a great advantage and would save them much of the delay and trouble they now experience in starting on their return journey. They are afraid of losing the return halves, however, more especially at a bathing festival and are too cautious to take what they consider an unnecessary risk. Moreover there would generally be no saving in their doing so as the railways charge the full double fare for a return third class ticket. Be the cause what it may, practically every pilgrim comes on a single ticket and has to re-book at the end of the festival. Were it possible to induce them to take return tickets instead, not only would it be an advantage to themselves but many of the booking difficulties which now beset the railway administrations would also be removed. The third class fare is already low but in spite of this the granting of a small concession on the return journey to these places of pilgrimage deserves the most careful consideration. It is true that where a reduction has been given in the past, few have availed themselves of it, but the experiment has been made only on a very limited scale. Were the railways to make a general practice of giving return tickets to all the chief places of pilgrimage at reduced fares, the fact would soon become widely known and would probably be largely taken advantage of.

(g) It is not uncommon for the booking clerk to run short of small change, and this gives rise to disputes and delay, or
Money-changers. the pilgrim has to go without his change. This

could be avoided very considerably by having one or more money-changers in the railway compound to whom the pilgrims could go before buying their tickets. The table of fares to all stations should be prominently displayed near the money-changer and also on the main approach roads to the station.

68. We have discussed the different means by which the railway authorities may help in lessening the dangers to the public health consequent on overcrowding and detention at the railway station when the pilgrims are departing. In this

Departure of pilgrims—Melas should not be dispersed because of an outbreak of Cholera.

connection there is another matter of sufficient importance to warrant special notice. It frequently happens that when an outbreak of cholera occurs during a festival at a place of pilgrimage the local authorities decide to break up the mela and disperse the pilgrims to their homes. This procedure is apparently, followed by the best of results as a rule, and has gained much credit as a measure for stemming the flow of infection: the epidemic quickly dies out and the place of pilgrimage is soon able to show a clean bill of health. Unfortunately these good results are usually confined to the place of pilgrimage and the measure is really one fraught with grave danger to an area co-extensive with that from which the pilgrims happen to have been drawn, and not infrequently culminates in an outbreak of disease which is both widespread and severe. Were the infection of cholera one of locality the dispersal of the crowd away from the area of danger would be the best thing to do: but it is not so. As we have already seen cholera infection is carried and spread about, not only by the sick, but also by many of those who have recovered and by others who are apparently quite well but have been attendants on the sick. The real source of infection is not in the place but amongst the pilgrims themselves. The mere moving of the crowd away from the town, therefore, can give but little advantage: the town is protected but when the pilgrims are dispersed the infection is scattered broadcast with them to start new centres of sickness elsewhere. This, however, is not the chief danger. We have already described how eager the pilgrims always are to get away so soon as the festival is over, and how they frequently crowd to the station in numbers which it is quite impossible for the railway to deal with. The time of departure is always one of anxiety to the Health Officer and his staff, for it is then that their difficulties become greatest, and the outbreak of epidemic disease is most likely to occur. If the festival is dispersed on account of sickness, however, and panic is added to the natural desire for speedy departure all the dangers and difficulties are intensely aggravated. Both the railway authorities and the health staff are taken at a disadvantage by the premature breaking up of the mela: the crowds at the station are larger, and the arrangements for dealing with them are usually incomplete. Detention and overcrowding of the pilgrims at the railway station necessarily follow and with infection and sickness already present amongst them and sanitary control in abeyance, a large increase in the number of contact infections both at the railway station and in the overcrowded trains is practically unavoidable. A gradual breaking up of the mela is what should be aimed at and the local authorities should direct all their energies to bringing this about.

69. We have seen that difficulty in booking makes it necessary for the pilgrims to come very early to the railway station to get their tickets. Another reason is that the special trains have to run as circumstances will allow and the

Departure of Pilgrims—waiting accommodation.

departures cannot be advertised. The pilgrims have no information when their trains are likely to start and consequently flock to the station in the late afternoon and early evening so soon as the festival of the day is over. No railway has the rolling stock or the other facilities to despatch them as they collect. The result is that having booked, some may get off almost at once, but the majority have a long wait often extending to 6 or 8 hours: when for any reason a block on the line occurs the detention may be very much greater. It is obvious that there should be some place at the station for the passengers to

wait. This need not be roofed over in its full extent; it would be unreasonable to expect that it should, but, for the reasons given below under conservancy, it should be enclosed throughout by a fence and provided with lights. It is also desirable that access from this enclosure to the platform should be otherwise than through the main entrance to the station, the latter being reserved for passengers of a higher class than third.

70. We would strongly recommend that at least part of the waiting enclosure

Departure of Pilgrims—use of pens. should be divided off by barriers into pens so that the pilgrims may be sorted out according to the direction in which they will travel. When the pilgrims are all kept together in one enclosure, or, as is the case at some stations, in no enclosure at all, they rush for each train as it comes in, quite irrespective of whether it is going in the direction they wish to travel or not. It is only after much struggling and jostling on the platform that the right passengers are separated out: delay in entraining follows and accidents are probable. With separate pens the passengers can be sorted out for the different trains so soon as they have taken their tickets, and they then wait patiently and contentedly for the arrival of the train in which they are to go: from a confused and disorderly rabble the crowd becomes transformed into a series of well regulated groups. Not only are the traffic arrangements greatly simplified and delay in entraining avoided by the use of pens but the general sanitation and the detection of infectious sickness are also made much easier. Some railways attempt to do without them but this has no merit save that of economy.

The best and most convenient arrangement of pens is that shown diagrammatically in Appendix XXXII. After taking their tickets the passengers come to a bottle neck from which a separate passage leads to each pen. At the bottle neck are stationed one or more ticket collectors who examine the tickets and direct the passengers to the appropriate pens.

Each pen should be provided with a good supply of food and water and with sufficient latrine accommodation for males and females. The sweepers should have separate access to the latrines from outside so that they may do their work without the necessity of passing amongst the waiting pilgrims. The pens should also be provided with light. To give protection from sun, rain and dew they should be roofed over as far as possible and the unroofed portion planted with shady trees. Good drainage should be provided and it is an improvement to have the roofed portion of the enclosure paved. When a train arrives every one is eager to get on the platform as quickly as possible to secure seats in the train. The exits from the pens should therefore be broad and if possible approached by a short ramp to relieve the crush and heavy pressure round the gates.

At terminal stations where there are more platforms than one the different platforms can be used as substitutes for pens. With this arrangement an empty train is kept against each platform and as the passengers arrive and purchase their tickets they go straight to their seats. When a train is full it is started off and another takes its place. The system has only a limited application and, unless there is an ample supply of rolling stock, is unlikely to be so satisfactory in practice as that with separate pens.

71. We had several complaints as to the inadequacy of the covered waiting

Departure of Pilgrims—covered waiting accommodation.

accommodation at several of the mela railway stations. As a rule the complaints were exaggerated. It is true that, while the majority of the pilgrims are not likely

to take harm from waiting in the open, there are also many who are old and frail or who are unaccustomed to exposure at night. Still the railway administrations cannot be expected to provide covered accommodation at places of pilgrimage for even a tithe of the large crowds entraining after an important festival. All that can be looked for is an amount of covered accommodation slightly in excess of what would be justified by the average regular traffic throughout the year, and at most of the places of pilgrimage this has already been given. Later in the report, when pointing out particular requirements at individual stations, we will refer to those at which we think the accommodation might be increased with advantage.

72. The water supply at railway stations is, in almost all cases, good and quite ample for the needs of the regular passenger traffic. For the crowds waiting to entrain after an important festival, however, special arrangements should be made

Departure of Pilgrims—water supply.

so that the pilgrims may have a full supply of water before starting on their journey. Open wells are not satisfactory as they are always liable to pollution by dirty ropes and lotas. At all stations for places of pilgrimage, or important junctions, the water supply should be laid on in pipes to the waiting enclosure, the pens and the platform.

73. The latrine arrangements at all the railway stations we inspected were quite satisfactory, there being separate accommodation outside the station for passengers arriving and departing. This is necessary wherever there is much traffic

Arrival and Departure of Pilgrims—conservancy.

as the platform latrines are of little use except to passengers passing through. To prevent passengers without tickets slipping through them, and so escaping from the station undetected, the platform latrines must be accessible only from the platform. Departing passengers, however, are not allowed on the platform until the train is signalled, or more frequently until it has arrived. There is then time for nothing but to secure a seat. On arrival the only matter of importance to the railway staff is the collection of tickets, and the passengers are hustled off the platform as fast as possible.

We have already seen that at the departure station the pilgrims collect in the early evenings and have a long wait as a rule before their trains start. Adequate latrine accommodation both for males and females is therefore essential if pollution of the whole area round the station is to be avoided. Experience also shows that the waiting enclosure should always be fenced in and lighted. If this is done the tendency is for the pilgrims to use the latrines; but, if not, they wander off a short distance for the purposes of nature to the nearest depression or other cover and, in the dark, dispense even with this concession to decency and use the open ground in the immediate vicinity of the place in which they happen to be sitting.

The need for latrine accommodation on arrival is almost equally important. We have already pointed out the difficulties experienced by the pilgrims *en route* and when they reach their destination the necessities are often urgent. The platform latrines are not available and if other accommodation is not provided the surroundings of the station become grossly polluted.

G.—MEDICAL ARRANGEMENTS.

74. We have already noted how the increased facilities afforded by the railways for the transport of pilgrims involves correspondingly easy and rapid means for the dissemination of infectious disease: in other words, the better and quicker

Medical Arrangements—need for improvement.

the railway communications become, the faster and further will infectious disease spread, unless there is a proper agency on the railway to detect and treat the sick without delay. How great the danger may be is well shown by the tables kindly furnished to us by the Bengal Nagpur Railway and given in Appendix VI. On this railway careful and accurate records are kept of all cases of, and deaths from, infectious sickness occurring on their premises, and the tables have been prepared by extracting cases of sickness and death amongst passengers only. They are interesting, not only as showing the occurrence of infectious diseases amongst the passengers in every month throughout the year, but more especially as indicating the disastrous results which may be expected to follow an epidemic at a place of pilgrimage in these days of speedy transit by rail. An analysis of the tables for the whole of the year 1912 shows that 492 passengers either dead of, or suffering from, cholera, 16 passengers dead of, or suffering from, smallpox and 27 passengers dead of, or suffering from, plague, were removed from trains or waiting sheds on this railway alone. The stations at which the removals took place are shown graphically in the map, Appendix XXXIII: practically no

section of the line was free but cholera was most common on the eastern sections, while plague and small-pox occurred most on the western. Of the total 535 passengers removed 135 or 25 per cent. were not discovered till after death. The results for July alone, however, are even more interesting and have already been referred to in the general part of our report. During this month, while the pilgrims were dispersing from Puri where there had been a severe outbreak of cholera at the Rath Jatra Mela, 408 passengers either dead of, or suffering from, that disease were found in the trains or in waiting rooms on the Bengal Nagpur Railway. Excluding from this number 116, in which the station of origin was not known, no less than 251 out of the remaining 292 were pilgrims returning from Puri. More important even than the large number of cases, however, is the widespread distribution that occurred practically over every branch of the line as shown in the map, Appendix VII. From this one pilgrim centre infection was spread by rail not only to other parts of the province of Bihar and Orissa, but also to Bengal, to the Central Provinces and to Central India. Unfortunately it was not possible to trace the distribution further on connected lines, or in the villages to which the pilgrims returned, but the number of contact infections contracted in the railway wagons and carriages must have been very great and in the Central Provinces an infection was lit up from which over 34,000 lives were lost.

The above is an isolated instance, but there is no apparent reason why the results following the outbreak of cholera in Puri in 1912 should have been exceptional. Similar outbreaks are frequent at other centres of pilgrimage, and were careful records kept on all the railways, a like widespread diffusion of infection would probably be found to occur from them also.

It is obvious that something must be done to counteract this unfortunate result of increased railway communications. Better sanitation at the places of pilgrimage and at fairs will undoubtedly do much, and every effort should be made to bring this about. At the same time the railways cannot be considered altogether free of responsibility and it is essential that their medical and sanitary arrangements should also be improved.

The first need is clearly some means whereby cases of infectious disease amongst the pilgrims waiting in the station compounds, or travelling by rail, can be easily and quickly detected. To ensure this some kind of medical inspection of all the passengers must be provided at those stations which are much frequented by pilgrims. The need is already recognised by some of the railway administrations but is only very partially met. The Bengal Nagpur Railway posts Sub-Assistant Surgeons at Puri and other stations on their line during the larger and more important festivals, and the East Indian Railway arranges to have its own medical staff at all big mela stations. But the results we have just quoted for 1912, when 25 per cent of the sick were dead before they were discovered, show that the present arrangements are not sufficient. Some railways make no arrangements whatever for the medical inspection of passengers. Such inspections, however, are clearly necessary. A case of cholera left to travel in the train has practically no chance of recovery and there is the very gravest risk, amounting almost to a certainty, that some of the fellow passengers will also contract the infection. In the interests of the patients themselves and to prevent them being a danger to others it is essential that they should be promptly isolated in hospital where they can be comfortably housed and treated. But there is no necessity that the inspections should be elaborate. Most cases of the more important infectious diseases are sufficiently obvious to a medical officer to make a detailed inspection of each passenger quite superfluous. Nor do we think it necessary, as was suggested to us, that a Sub-Assistant Surgeon should travel with each pilgrim train. As a matter of fact it would be impossible to recruit the large temporary staff which such a measure would necessitate. All that is needed is that each of the pilgrims should pass under review before entraining and at fairly frequent intervals during the journey. For this purpose we recommend that during important festivals, Sub-Assistant Surgeons should be posted at the mela stations and at the chief junctions on the lines leading therefrom. Their duties would be to meet all trains, to watch the passengers entraining and detraining, to look for cases of sickness in the carriages and wagons, and to move

about amongst the passengers on the platforms, in the sarais and in the waiting sheds, and note and enquire into any serious cases of illness. There would be no personal examination as, with a little tact, all the information necessary would be easily elicited by questions. In this connection the pilgrim sarais, which we have recommended should be built at railway junctions, would be most useful. In them the sick would tend to halt and, the inspection being carried out more leisurely, there would be little chance of their escaping observation.

As an objection to these arrangements it was suggested to us that the railway administrations would have great difficulty in recruiting the extra staff required. Should this prove to be so, we would suggest that assistance might be given by the local Government, the pay of any officer deputed by the latter being made a charge on the railway concerned.

The early detection of cases of infectious sickness is, however, only the first need ; it is of little use unless several other important matters which follow on it are promptly attended to. These are (a) that the patient be given medical first-aid, be isolated and be conveyed to hospital for treatment as quickly as possible, (b) that the clothes of other passengers which have been soiled by contact with the patient or his *dejecta* be disinfected and (c) that the carriage or wagon in which the patient has been travelling or other places contaminated by his *dejecta* be also disinfected. With respect to each of these matters, improvements in the present procedure are desirable.

- (a) It is not sufficient, in our opinion, for the station master or other railway official merely to inform the police of the occurrence of a case of sickness. The police should, and will, give all the assistance that they can but the responsibility that medical first-aid is promptly rendered, and that means are provided for conveying the patient to hospital in all cases of illness occurring on its line or in its station yards, should rest with the railway administration and it should maintain sufficient medical staff and hand ambulances for this purpose. With regard to the after-treatment of the patient the case is somewhat different and, wherever possible, the railway administration should be relieved of this duty. At all places where there is a civil hospital or dispensary, and this would include all the mela stations and most of the railway junctions, arrangements for treatment of the patients should be made by the civil authorities.
- (b) In a crowded railway carriage or goods wagon it is practically impossible for the other passengers to avoid having their clothes soiled by the *dejecta* of a cholera patient near them. Such clothing should of course be disinfected at once, and to avoid unnecessary delay and trouble to the passengers the work should be in charge of a medical officer who understands the use of disinfectants and is able to recognise where there is danger and where there is none. Very frequently, however, no steps appear to be taken to have this disinfection carried out, or the duty is delegated to some one with no knowledge of the work.
- (c) The carriage or wagon from which a cholera patient has been removed, or the place where he has been lying in a sarai or waiting shed, and the latrine he has used, should also be cleaned and disinfected. In most cases we found the arrangements for this work unsatisfactory, and supervised by men who had no clear notion of what was required. At many of the stations there were no disinfectants at all ; at others the station master had a small supply which was rigorously locked away in the store room.

The Sub-Assistant Surgeons whom we have recommended should be posted temporarily to the mela stations and railway junctions, should be able to carry out all these duties in addition to the inspection of passengers. They would further be useful in supervising the general conservancy of the station compounds.

With the arrangements for medical inspection recommended we do not think that cases of infectious illness would often be found at stations between

the junctions. Should, however, this occur the patient should not be removed from the train but should be carried on for treatment in his carriage or wagon to the first station where medical aid is available and where the measures referred to above can be carried out efficiently and under proper supervision.

H.—PASSENGER SUPERINTENDENTS.

75. On some of the railways retired Indian military officers are employed as Passenger Superintendents, their duties being to prevent petty extortion and oppression on the part of the menial staff, to inquire into any grievances of the passengers, and generally to further the comfort of the passengers and see that they are given all the assistance possible during their journey. The appointment of officials of this social standing might, we think, be profitably extended. They should, however, know English and be specially trained for the work. At centres of pilgrimage and at the sarais at junctions they should prove specially useful.

I.—VOLUNTEERS.

76. Among the many Indian gentlemen who came before us with suggestions for the improvement of the conditions under which pilgrims are now carried on the railways, there was a general consensus of opinion that much advantage would accrue from the emp'oyment of "volunteers," that is, of unpaid non-officials who would, in the name of charity, do all they could to assist passengers on the days of the crowded festivals. Such volunteers it was pointed out could not only help the pilgrims to get tickets, they could see that they were not overcharged for them; they could assist the old and infirm through the crowd or find places for them in the train; they could take charge of strayed children or others, look after lost luggage, report to the railway authorities any matter needing attention, and generally make themselves useful: in addition they could afford much assistance to the health staff by giving prompt information of any infectious disease and, if trained, by giving first-aid in cases of sickness or accident. That they would do all these things cheerfully and well was the opinion of almost all the Indians whom we consulted. The railway administrations, however, are inclined to be less enthusiastic. They fear that, in their zeal to do good, and through ignorance of the regulations and the absence of discipline, the volunteers might exceed the duties assigned to them, and that thus friction might arise between them and the official staff which could only increase confusion and lead to hindrance instead of help.

During our visit to Puri we had an opportunity of watching volunteers at work amongst the crowds at the Rath Jatra Mela in the town. On that occasion they were organised under a capable and reliable captain who was able to enforce discipline and were doing most useful work in marshalling the pilgrims, in supplying them with water, in giving first-aid to the sick, and generally in helping the police. That there is ample scope for similar work at the railway stations amongst the huge crowds of departing pilgrims no one can doubt who has watched the latter entraining and, if the wish to assist the pilgrims be genuine, volunteers, similarly organised to those at Puri, should find little difficulty in convincing the railway administrations of their ability to work in concord with the railway staff and of the value of their help. The object these voluntary workers have in view and that of the railway officials is the same, and if the assistance is rendered honestly and well, there can be little doubt but that it will be fully welcomed.

PART III.

PLACES OF PILGRIMAGE—SPECIAL RECOMMENDATIONS.

A.—PURI.

77. Puri, the headquarters of the district of the same name, is a municipal town with a resident population of about 35,000. Its average annual income for the last five years, excluding grants and contributions except those from local funds, was Rs. 74,185 and the incidence of taxation in 1913-14 was Re. 1-6-11. It has no trade or manufactures of any consequence.

The town, of which a map is attached as Appendix XXXIV, lies on the shore of the Bay of Bengal and consists of two distinct portions—the Balukhand, a sandy tract along the sea beach, and the town proper, slightly more inland. The former is about a quarter of a mile broad at its western extremity at the Swargadwara but widens out gradually to about a mile at its eastern limit: excepting a small portion round the Swargadwara it belongs to Government and is occupied by various public offices, residential bungalows and hotels: its eastern half is traversed by the Banki Mohan Nullah. The town portion centres on the temple of Jagannath from which it spreads out in all directions like a fan, the ribs of which are formed by streets leading to various shrines and sacred tanks, and the handle by the Bara Danda, the main road from the temple of Jagannath to the Gundicha-bari or Garden House. With the exception of the Bara Danda, which is a very broad open thoroughfare, most of the streets are narrow, mean and tortuous (Appendices XXXV and XXXVI). In the centre of the town the houses are closely packed together; many are built of masonry and some are two or three stories in height: further from the temple of Jagannath the streets become more widely separated and the open spaces to the rear of the houses lining the streets are larger and broader. Everywhere the common type of house is a hut, on a high plinth, with walls of split bamboo covered with clay and with thatched roof. The unoccupied ground behind the houses is very rough and uneven, is usually covered with scrub jungle and contains many shallow dirty tanks. The site generally is sandy and porous, and, though the ground water level is high, there is little tendency to flooding.

78. The town is famous as the site of the great temple of Jagannath the “Lord of the world” in whose courts priest and peasant become equal and the barriers of caste are broken down. The worship in the temple aims at a broad catholicism, which embraces all forms of Hindu belief and conceptions of the deity, and, pilgrims of every sect and from all parts of India are to be found throughout the year, paying homage at the shrine. The temple is a very ancient one and the pilgrimage to it has been popular for at least eight centuries. There are 62 festivals during the year but the majority of these are of local interest only and the attendance at them is not large. The chief festival is the Rath Jatra (Car Festival) which takes place in June-July, and next to it in importance come the Dol Jatra in February-March, the Chandana Jatra in April-May and the Snana Jatra in June-July. The number of pilgrims at each of these festivals varies; the attendance at the Rath Jatra may be from one to two hundred thousand and the total for the whole year is probably well over half a million.

Besides the temple of Jagannath the other chief shrines in Puri are (1) the Gundicha-bari or Garden House to which Jagannath with his brother Baibhadra and his sister Subhadra are driven in state during the Car Festival and where they remain for one week, (2) the four sacred tanks of Indradyumna, Markanda Narendra and Swetganga with the temple on their banks, (3) the Chakra Tirath where Jagannath came ashore from the sea, (4) the Swargadwara or “Door to Heaven,” (5) the Narendra or Chandan Tank where the Chandana Jatra lasting 21 days takes place in April-May and (6) the temple of Lokenath with the sacred tank of Parvati Sagar. Photographs of some of these are given in the Appendices.

79. Puri has the reputation of being the chief distributing centre for cholera in India; that this is not without considerable justification is shown by the numerous

instances, already referred to earlier in this report, of epidemics started in recent years by pilgrims returning thence to their homes. Dysentery and diarrhoea attract much less attention than cholera but the table of mortalities for Puri in Appendix XXXVII shows that both these diseases are markedly prevalent and that the town must be playing a similar rôle with reference to them also. The sanitary condition of Puri, therefore, is not a matter of merely local interest but one which is of vital importance to India as a whole.

80. (a) Some pilgrims obtain free food and lodging in the various maths or monasteries but, with the exception of mendicants and faqirs, their number is not large. For the general body of pilgrims free accommodation is provided only in the dharamshalas of which there are eight, with total quarters for between 900 and 1,000 persons. These institutions are doing most useful work but their number is small in comparison with the importance of Puri as a pilgrim centre: more are certainly required and we would strongly recommend this form of charity to the wealthy and pious devotee.

Of the eight dharamshalas four are privately owned and administered, two belong to maths, and two have been handed over for management to the Lodging House Fund Committee by their founders. On the whole the accommodation was good and obviously both care and money had been freely expended in making them as suitable for the reception of pilgrims as circumstances would permit. The water supply and conservancy arrangements were in some cases defective but as we shall see later this is more the fault of the general conditions obtaining in the town as a whole than of the owners.

(b) From the table in Appendix XXXVIII it will be seen that the number of licensed lodging-houses, as well as the accommodation they can give, varies greatly from year to year: the latter is ample at all times except during the Rath Jatra in June-July. That there should be a deficiency during this festival is doubly unfortunate as this is the season when heavy rain may be expected and when cholera is usually most prevalent in the town. Serious overcrowding of the lodging-houses at this time undoubtedly occurs but, what is worse, many houses, without licenses and quite unsuited for the purpose, are tempted by the high rents obtainable and take in lodgers also. In spite of both these facts there still remain large numbers of pilgrims who have to sleep out in gardens, or under such rude shelter as they can find, either because they are unable to get accommodation in a house at all or, more frequently, because they are too poor to pay the high prices demanded. The question of housing the pilgrims at this season presents a three-fold difficulty—overcrowding in the licensed lodging-houses, the receiving of lodgers in unlicensed houses and the houseless pilgrims.

The overcrowding in the licensed houses is, we consider, inevitable. The attendance of pilgrims at the Rath Jatra is usually more than double that at any other time of the year, while the average duration of their stay is probably less than one week. It would never pay the lodging-house keepers to provide accommodation for all the pilgrims under these circumstances and it must be remembered that these houses are kept for profit. It is useless, therefore, to expect that the lodging-houses will ever give sufficient room to meet the full requirements. The difficulty resolves itself into a question of choosing between two evils—overcrowding in the licensed lodging-houses where the people will be more or less comfortable and under supervision, or exposure of the pilgrims anywhere to the inclemency of the weather with all the discomfort and risk to health that that would involve. Without doubt overcrowding is the less danger and should be accepted frankly: but every endeavour should be made to keep it controlled as far as possible by the issue of excess licenses in the method indicated earlier in the general part of our report.

The receiving of lodgers in unlicensed houses is very common and many householders, we are informed, send away their families during the Rath Jatra so that

they may take in lodgers and turn the festival to profitable account. This is a more serious matter than overcrowding in the licensed houses: it is not only that the pilgrims in these private houses are more likely to be attacked by infectious disease, owing to the very insanitary conditions in which they are living, but that, should cases occur, the house owner tries to conceal them rather than risk prosecution for keeping lodgers without a license. This is well illustrated by certain statistics we were able to get for the years 1910-11 and 1911-12. Whereas in the licensed lodging-houses during these two years 104 cases of cholera were sent to hospital as against 26 who died before removal, the figures for the private houses were 38 and 175 respectively. With so high a percentage of concealment as these figures indicate effective measures for dealing with an epidemic are, of course, impossible. Much of the difficulty could, we think, be got rid of by a freer issue than at present of temporary licenses to houses which do not quite come up to the full sanitary standards required of the regular houses. Theoretically this would be unsound, but it would mark a distinct advance on the existing conditions by ensuring that the houses taking in pilgrims would be known and would come under inspection: one of the chief causes for concealing sickness would also disappear.

The houseless pilgrims are chiefly beggars or poverty-stricken, half-starved, often diseased, individuals who have come to Puri to die near the holy temple of Jagannath.

Pilgrim shelters. nath, but amongst them are also many respectable people too poor to pay the exorbitant charges of the lodging-house keepers. For the former the provision of camps, where they can be kept under some degree of sanitary control, is necessary: by the latter the possibility of obtaining shelter from the inclemency of the weather for a small fee would be much appreciated. Earlier in this report we have recommended the construction of pilgrim shelters in such cases and in Puri they are much needed. As a matter of fact four, each capable of accommodating about 150 pilgrims, have already been erected on the Bara Danda by the Lodging House Fund Committee. They have masonry plinths and iron roofs and are supplied with latrines and with a water supply from an overhead tank: the general arrangement is shown in the photograph, Appendix XXXIX. This is a beginning but many more are required. When new ones are built the roofs should be lower and side walls should be added as a protection from rain. The Bara Danda is an excellent open site and is central, during the Rath Jatra, at which time the shelters are most needed. But there is no reason why the shelters, if built, should not be used at the other festivals also; and for this a site nearer the centre of the town would be preferable. We would suggest for this purpose the ground to the north-west of the Narendra Tank which is now covered with scrub jungle and which, during festivals, is much fouled in the early mornings and evenings. In this position the shelters would be useful during the Chandana Jatra and a very insanitary area of the town would be much improved.

(c) Some of the licensed lodging-houses are built of masonry but the vast majority are single-story huts with bamboo and mud walls and thatch roofs. The

Licensed lodging-houses. huts are usually arranged in the form of a quadrangle with a central open courtyard. The rooms are as a rule dry and clean with plenty of light and ventilation: in many the floors are of concrete. It is with regard to water supply and conservancy that the main sanitary defects exist: with a few exceptions each house has its own polluted shallow well, its own foul leaking cesspool, and its own uncovered evil-smelling latrine. Our recommendations for improving these conditions are inseparably bound up with those for the water supply and conservancy of the town as a whole and will be discussed later.

81. The most serious defects in the public health administration of Puri are connected with the general conservancy.

Conservancy. Most of the arrangements are exceedingly primitive and the wonder is, not that cholera, dysentery and diarrhoea are prevalent in the town, but that they are not much more so.

The number of private latrines is not known but they are very numerous

Private latrines. (said to be over 5,000), there being one or more attached to almost every house. In

The vast majority of cases these are simply little patches of ground in the back

yard of the premises which have been enclosed with a low mud wall and provided with a few bricks or stones for foot-rests. The nightsoil is supposed to be collected and removed daily by a sweeper but all the liquids soak into the sandy ground : in the rains most of the solids also disappear in the same way. During our inspection we constantly found these latrines in an indescribably filthy state : in some the nightsoil was lying as it had been deposited for days previously, while in others it had been collected in a festering heap in one corner or in open kerosine tins, *gurrahs* or baskets, pending removal. The general arrangement of these latrines all over the town is well illustrated by the sketch, Appendix XL, of one small area which by chance happened to be the first that we visited. Conditions more favourable to the breeding of flies and the spread of infection it is scarcely possible to imagine. Our inspections, it is true, were made at a time of special pressure on the conservancy department, during the Rath Jatra, but it is just at such times that the dangers are great and everything should be in exceptionally good order. Where masonry latrines had been built the conditions were much better but, there too, defects were common : most were without roofs, few had receptacles, and in all the height of the seats from the floor was much too great.

The system whereby filth from the private latrines is carried to the trenching grounds through the public streets in shallow open baskets, *gurrahs* and old kerosine tins is objectionable. To some extent, however, this is necessitated by the fact that the sweeper passages leading to the latrines are very narrow and in many cases there are none at all and the sweepers, to get to the latrines, have to climb over the boundary walls from one compound to another. It would be quite impossible to take even small filth hand-carts along the sweeper passages but the present nuisance could be much mitigated were light airtight receptacles used. The construction of proper sweeper passages is, however, the true remedy.

Nearly every house has one or more cesspools for the collection of sullage.

Sullage disposal.

These are of very varied type but a common variety is a large hole in the house plinth, with an opening on to the street for cleaning, as shown in photograph B, Appendix XXXVI. Most of the receptacles that we saw were full to overflowing with foul black sullage, and all allowed of free soakage into the ground : this indeed was necessary as they were never cleaned. In a few houses there are no cesspools, and the sullage is allowed to flow on to the ground and gradually soak away : this looks less tidy but the end result, as regards pollution of the town site, is the same.

There are nineteen public latrines all distributed, as shown in the map, Appendix XXXIV, on the outskirts of the town.

Public latrines.

Those that we visited were apparently not much used. Six are of iron, ten are of masonry and three are simple cactus hedge enclosures. The iron latrines are of a good pattern on the separate system : those of masonry have paved floors but no roofs : in the enclosure the users defecate on the ground and a sweeper comes along later and cleans the whole place up. Nightsoil and urine from the public latrines are removed in carts to the trenching grounds.

There are three trenching grounds east and west of the town in the positions shown on the map, Appendix XXXIV. In

Trenching.

all the soil is sandy and the operations were apparently being carried on quite satisfactorily. We received numerous complaints, however, regarding the nuisance caused by the trenching ground situated between the Railway Station and the Government Gardens. During the rains when the ground is moist the nightsoil disappears fairly rapidly, but at other seasons, we were informed, decomposition is very slow. Owing to the method of nightsoil collection in vogue every opportunity is given for the breeding of flies and, in the more recent trenches we examined, larvæ were numerous.

Very considerable attention appears to be given to the collection and disposal

Surface sweeping and rubbish removal. of rubbish, and the public streets and roads were clean and well swept. Dry refuse is used for filling in hollows and dirty tanks and also to give a foundation for roads.

The permanent staff and plant are shown in the statement in Appendix XVIII. The chief and most obvious defect is the inadequacy of the supervision.

Staff and plant. Jemadars on pay of Rs. 13 and 9 *per mensem* are in the position of requiring supervision, not giving it, so that the whole of the work devolves on the Sanitary Inspector, Mr. Madeira, who has held this appointment for some years, is intelligent and industrious but the work he is expected to do is far beyond the capabilities of any one man: further he is untrained. A town of the size and importance of Puri should, we consider, have at least 4 trained sanitary inspectors working under the Health Officer.

Another very apparent defect is the small number of nightsoil and sullage carts. As a matter of fact these serve only the public latrines, the hospitals and the dharamshalas, and all the nightsoil from the very numerous private latrines is carried by hand to the trenching grounds, there is no attempt to remove house sullage. There should be at least one nightsoil cart for every thousand of population: sullage, as we have already stated, should be removed by drains.

The ratio of sweepers to population is 1 in 145: this is too low even for a town possessing a good surface drainage system, a sufficiency of well distributed and freely used public latrines and an adequate number of carts. Puri has none of these and, in addition, is very poorly supplied with sweeper passages.

Another defect is the high proportion of the total sweeper staff employed on roads—nearly one-fourth. It is this which accounts for the well swept satisfactory appearance of the town, when seen only from the public streets, while behind the houses conditions are so defective.

Special arrangements for melas. Only for the Rath and Dol Jatras are any special conservancy arrangements made: at the other festivals the work is carried on by the permanent staff.

Extra public latrines are put up at the Markanda Tank and near the Garden House: a few urinals are also erected at different places. The number of extra sweepers employed varies with the anticipated size of the particular mela: in the case of the Rath Jatra they are engaged for about one month, and for the Dol Jatra for about 8 days. The sweepers are collected through the Collector from different parts of the district but they are only obtained with difficulty and never to the full number required: though untrained and unused to the work they have to be paid six annas a day and this causes trouble with the permanent sweepers who have at different times threatened to go on strike. Extra carts are not used as the bullocks for them would not be obtainable.

The municipality spends a great deal of money each year (an average of Rs. 28,811 for the last four years or 38.5 per cent. of the total income) on conservancy but, as we have seen, is getting a very poor return. It is only a small proportion of the total nightsoil and sullage that is being removed, and continued and dangerous pollution of the town site is taking place. There can be little doubt but that this is the main cause of the steady and persistent prevalence of cholera in the town throughout the year and of the frequently recurring severe outbreaks of that disease amongst the pilgrims. Contamination of the food by flies and a polluted water supply are the more immediate causes but both of these are due to the faulty conservancy. The chief defects lie in the system—the multiplication of private latrines of a defective type, the absence of good sweeper passages and the almost total dependance on hand carriage. Private latrines of the type we have described can never be anything but a danger no matter how large the staff employed or the measures taken to keep them clean. Disinfection with chloride of lime, as at present practised, is useful in diminishing the breeding of flies, but is expensive, and the ultimate fouling of the ground it affects but slightly. In the interests of the health of the town the private latrines should all be done away with unless properly constructed. In many cases the people will be unable to afford well built private latrines and a more ample provision of conveniently situated, well constructed, public latrines will be necessary. The second defect, the want of sweeper passages, is also one which calls for urgent remedy. Where it is necessary to climb over a series of walls to get from one latrine to another adequate inspection is impossible and the work must suffer. If the cleansing of private latrines is to be properly carried out sweeper passages

must be provided. A certain amount of land will have to be acquired but the expense should not be great and it will be more than recouped by increased efficiency and saving in labour. The third defect, carriage by hand instead of by cart or drains, is also one which affects both cost and efficiency. The waste is obvious: a drainage scheme for the removal of sullage and a sufficiency of carts for the night-soil are absolute necessities if the town is to be kept clean at a reasonable cost.

The above changes we consider necessary if the present system of conservancy by hand service and cartage is continued. Earlier in our report, however, we have strongly recommended that in places of pilgrimage a water-borne system of sewage is preferable and this applies with special force in the case of Puri. It is obvious that the present system breaks down at every festival just when the danger is greatest and, even with the improvements in method which we have suggested, this is likely to continue where extra sweepers and carts are so difficult to obtain. As we shall see later when considering drainage, sewers should be provided for the removal of sullage and it would be an unjustifiable waste, in our opinion, not to utilise them at the same time for the carriage of nightsoil as well.

82. A complete surface drainage scheme for the whole of the urban area of Puri was prepared by the then Sanitary Engineer for Bengal in 1904. The scheme

Drainage.

was essentially one for the removal of sullage, "the primary object" as stated in the original project being "to take the liquid wastes from the houses in the dense portions of the town" and "to abolish the objectionable household cesspits." The town was divided into 12 drainage blocks each with a separate outfall on to a sandy tract of land on the north, west or south of the inhabited area except in the case of two (1A and 1B) which had a combined discharge into the Banki Mohan Nallah on the east. The scheme was approved by the Sanitary Board and with some slight modifications received the final sanction of Government in 1907. The total estimated cost was Rs. 2,29,838 and, as the municipality were without funds, permission was given to commence with 5 blocks only (1A, 1B, 2, 3 and 4) covering the central and most densely populated parts of the town and estimated to cost Rs. 1,25,000. A grant of Rs. 75,000 and a loan of Rs. 50,000 were given to the municipality by Government and work was started in 1908. Progress, however, was unsatisfactory and owing to friction with the contractors the contract was terminated in 1910 after work to the extent of Rs. 62,775, which included the construction of parts of the main drains and a certain number of branch drains, had been completed. In the same year the outfalls for the drainage of all five blocks were revised by the Sanitary Engineer: that for blocks A and B into the Banki Mohan Nallah had never been considered satisfactory, while many new buildings had been erected along the sea front since the inception of the scheme, and the land originally intended to be used as a sewage farm for blocks 2, 3 and 4 had gone up very greatly in value. In the revision it was proposed that the dry weather flow of sullage from the eastern outfall into the Banki Mohan Nallah, as well as the flow during slight showers of rain, should be taken direct to the sea by the shortest route in a 12" stone ware pipe and discharged below high water through a reinforced concrete outfall pipe on reinforced concrete piles: in heavy rain the storm water and diluted sullage not taken by the pipe would overflow into the Banki Mohan Nallah. It was also proposed that the combined sullage from blocks 2, 3 and 4 should be discharged into the sea but that, owing to the undesirability of having a drainage outfall in proximity to the bathing ghat at the Swargadwara, a sewer should be constructed to carry it further west and well away from that sacred spot. Both these proposals were approved by Government and the positions of the sewers are shown approximately by dotted lines in the map, Appendix XXXIV. Revised estimates were prepared to include these additions to the scheme and these showed the probable total cost of the drainage of the five blocks to be Rs. 2,02,775. Further grants amounting to Rs. 50,831 were given to the municipality by Government and work on the scheme was restarted under fresh contractors in July 1912. In May of that year, however, the Bengal Nagpur Railway administration raised objections to the position of the new eastern outfall and also to the storm overflow into the Banki Mohan Nallah. To meet the latter difficulty the Sanitary Engineer, Bengal has proposed the replacement of the 12" stoneware pipe by a 4" sewer, the approximate difference in cost being estimated at Rs. 26,455. Pending a decision, on these and other points, work on the drainage has again been stopped after

completion of the western outfall and construction of the eastern as far as the Banki Mohan Nallah.

None of the other seven drainage blocks have been touched as yet but their cost is estimated at Rs. 1,25,000 so that the probable total cost of the complete surface drainage of Puri, if persevered with, will be a little over Rs. 3,25,000.

83. A most important point for consideration with reference to any drainage scheme is whether the system adopted is that

Unsuitability of surface drainage to the requirements of Puri. most suited to the special conditions of the place, and to the specific purpose, for which it is intended. Each in its own way,

surface drainage and sewerage, whether on a combined, or on a separate system, is good but they are not equally suitable under all circumstances. In our opinion this is exemplified in Puri and the combined system of surface drainage for both storm water and sullage, which has been adopted there, is not the best which might have been chosen.

The soil on which the town is built is loose and sandy: any rain which falls quickly disappears into the ground and there is never any tendency to flooding: storm water drainage is, therefore, not required. This was well recognised when the scheme was first designed as in the original report explaining the project it is stated that "owing to the nature of soil, which, as already stated, consists entirely of sand, there is no great necessity in Puri for a drainage scheme merely to deal with rain water which is rapidly absorbed into the ground". The same report, as we have already pointed out, placed the removal of sullage very definitely in the foreground as the primary object of the scheme and stated that the rain water "falling on a strip fifty feet wide on each side of every road along which drains are carried" was only admitted as "otherwise whenever it rained a mixture of rain water and sullage would overflow on to the roads". In other words, the complication of having to deal with storm water both in the drains and at the outfall was unnecessary, but was forced on the Sanitary Engineer by his choice of a surface system for the sullage removal and by that choice only with sewerage it would never have arisen. That in spite of this he did adopt surface drains in preference to sewers is probably due to the fact that even as late as 1904 sewers were still regarded with some mistrust by many in India. This is not so now, and it is everywhere recognised that sewerage is the best and most satisfactory method of dealing with sullage where, as in Puri, it can be dealt with alone. The smaller and more regular flow which results from the exclusion of rain offers so very great advantages, both in the construction of the drains and in the disposal of the sewage at the outfall, that for these alone sewerage on the separate system should certainly have been chosen.

Another strong reason why sewers should have been preferred to surface drains is that the latter are not well suited to the peculiar conditions existing in the town. The soil is loose and sandy, few of the roads are metalled and still fewer metalled in their whole width, while the majority of the houses are built of mud. During the dry weather sand is blown into the open surface drains in large quantities and, in wet weather, mud, from the house walls and plinths and from the roads, is washed into them by the rain. Already in the town most of the street side drains have not only become completely silted up but are actually buried altogether to a depth of some inches. How great the difficulty of keeping the drains clear will be, is well shown by the photographs of the newly constructed eastern outfall drain in Appendix XLI. This drain has already in the few months since its completion become so silted up that the masonry is completely buried. Even with heavy expenditure on cleaning and flushing, such exaggerated silting must always interfere greatly with efficiency, and as a corollary to surface drainage in Puri it would be imperative, in our opinion, that all roads and streets with side drains should be metalled in their full width. This again would involve large expenditure, both initial and recurring, which is not otherwise necessary as wheeled traffic is light. Removal of the sullage by sewerage instead of by surface drains would without doubt give the simplest and easiest solution of the difficulty.

Another point of less importance, though well deserving of mention, is that sewerage would do away with the streams of foul sullage and urine constantly seen along the sides of every street. Even in well constructed and regularly flushed

drains these are objectionable and unsightly: if the drains are not kept thoroughly clean gases of decomposition are given off and the silt in them is apt to become a breeding place for flies.

84. So far we have considered the question of sewerage and surface drainage in Puri from the point of view of the removal of sullage only. Even with this very limited outlook there can be little doubt but that sewerage would be the better: the chief advantages it gives over surface drainage, however, are the additional ones of speed and facility in dealing with the removal of nightsoil. Earlier in our report we have discussed this aspect of conservancy with regard to places of pilgrimage generally, and each of the arguments there adduced in favour of sewerage applies with special force in Puri. The present arrangements for night-soil removal are expensive, inefficient and objectionable: they also lack elasticity and a breakdown occurs at every *mela*. We have carefully examined the whole question and have no hesitation in stating that the only satisfactory method, both as regards efficiency and expense, of dealing with the existing defects and the resulting excessive prevalence of cholera, diarrhoea and dysentery in the town will be by a system of sewerage. We strongly recommend that early steps be taken to have a project prepared with this object. We recognise that this practically means a waste of the money already expended on drainage in Puri but we are convinced that sooner or later sewerage will have to be adopted and it is better to recognise at once that a mistake has been made than to continue adding more money to that already gone.

Should our recommendation be accepted some of the present works might be made use of, but the new project should be drawn up not with this object in view but on its own merits. More than one outfall will be necessary and these should be chosen with a view to land treatment of the sewage. Plenty of suitable waste land is available, specially on the west of the town, and, to avoid contamination of the wells, as much of the sewage as possible should be diverted in this direction. In the east and north east, pumping may be necessary to get the sewage on to the land, but we consider this preferable to discharge into the sea or the river. Freed from any excessive dilution with storm water the total quantity of sewage to be raised would not be great and the lift would be only a few feet at most: the cost of pumping would probably be covered by improvement of ground now lying waste. Discharge into the river, on the other hand, would certainly result in considerable nuisance as the flow is slight; while discharge into the sea would necessitate expensive outfall works to withstand the force of the storms on this coast and would give rise to serious pollution of the foreshore. The latter might be obviated very considerably by tank treatment before discharge, but even then there would be grave sentimental objection, if not also demands for compensation, by the owners of bungalows along the beach.

85. The drainage system, so far as at present constructed, has two outfalls known from their position as the western and eastern main drainage outfalls, respectively. They are both shown in the map, Appendix XXXIV.

(a) The western outfall, which serves the drainage of blocks 2, 3 and 4, is situated on the sandy beach to the west of the Swargadwara and about 100 yards above high water mark. Sullage and storm water are brought to it in a masonry sewer 5,400 feet in length followed by an open trench partly lined with masonry for another 400 feet. These have both been completed at a cost of about Rs. 53,000 but the trench soon became filled with loose sand and the outfall has not as yet worked.

The present arrangements at this outfall we consider unsatisfactory: constant trouble is likely to arise from the open trench silting up with blown sand and the cutting across the beach, which will form so soon as sullage begins to flow, will quickly become malodorous and unsightly. Our recommendations, however, must necessarily depend on the future use to which this outfall will be put. Should our main recommendation regarding the adoption of a sewerage system for Puri not be accepted and this outfall be retained as an outlet for sullage and storm water,

the sewer should be continued so as to discharge at, or below, low water mark : a flap-valve would also have to be fixed at its end. At certain times of the year the current along the shore is towards the Swargadwara but we are not inclined to attach much importance to any supposed danger to the public health on this account : nor do we anticipate, from the evidence before us, any very strong or general objections on sentimental grounds either from the pilgrims or the people of the town. Should, on the other hand, our recommendation regarding sewerage be adopted, one of three things may happen (a) it may be found desirable, on account of expense, to retain this sewer as a sewage outfall for a part of the town or (b) it may be used for storm water only, or (c) it may be altogether discarded. In either of the two latter events no further expenditure on it is necessary or desirable. But should it be used as part of the sewerage system not only should it be continued so as to have an outfall at, or below, low water mark, and protected with a flap-valve but a small tank should also be constructed in its course in which solid excreta will be intercepted and broken up. The tank need not be a large one but it is essential, as otherwise the solids will rise to the surface, be washed ashore, and foul the beach.

(b) The eastern outfall serves the two large drainage blocks 1A and 1B
Eastern outfall. and is much bigger than the western. In the original scheme this outfall was into

the Banki Mohan Nallah, a broad shallow sandy depression which acts as an overflow to the Sar Lake, a large inland sheet of water about four miles long by two broad and about eight miles from Puri. Before reaching the sea the nallah bends back on itself in a large loop and so traverses the whole of the eastern half of the Government estates twice as shown in the map. The stream along the nallah is not a constant one but comes down in several freshets during the rains : for the rest of the year its course is marked by a series of isolated, stagnant pools much resorted to for bathing, and by dhobies for washing clothes : during the hot weather these pools gradually dwindle in size and many disappear altogether. As more and more building sites in the Government estate were taken up and bungalows erected, it became obvious that a sullage outfall into this nallah would be extremely undesirable. The Sanitary Engineer, therefore, put forward a proposal to continue the outfall drain from the point where it meets the Banki Mohan Nallah, by a 12" stoneware pipe direct to the sea. By this means the dry weather sullage and also the storm water due to light showers would be discharged into the sea below high water, while during heavy rain the storm water and diluted sullage not taken by the 12" pipe drain would still overflow into the Banki Mohan Nallah. To this proposal Government accorded sanction but the Bengal Nagpur Railway Administration have raised objections both to the pipe drain outfall on to the sea beach and to the storm water overflow into the nallah. With reference to the former they hold that a sullage outfall on the beach will spoil the amenities of Puri as a health and pleasure resort in the eyes of visitors, and to the latter that the storm water will stagnate in pools in the bed of the nallah and not only become a nuisance to the ever-increasing number of residents who have built bungalows on the estate, but also pollute the sub-soil water from which they get their drinking water supply. Meanwhile the main outfall drain has been completed as far as the Banki Mohan Nallah and Government has ordered the suspension of further work till the question of the outfall has been more fully considered.

Of the two objections brought forward by the Bengal Nagpur Railway administration the second is of little importance as it could be readily met by the substitution of a 4" masonry sewer for the 12" stoneware pipe and the abolition of the storm water overflow. The first, however, is a serious difficulty. The popularity of the Government estate at Puri as a health resort is undoubtedly on the increase both amongst Europeans and Indians and there is every prospect of its making a still more marked advance in public favour should the prevalence of cholera be diminished in the town. That this popularity will be seriously checked by a drainage outfall in the centre of the beach, we are in entire agreement with the Bengal Nagpur Railway administration. To the public mind such an outfall is always associated with nuisance and danger. The real assets of the estate are three only—the cool breezes, the beach and sea bathing—and in the popular

imagination all will be equally and adversely affected. Of real danger or nuisance, if the outfall is properly constructed at, or below, low water mark, we consider there will be none, but this is of little consequence. The matter is purely one of sentiment and is not open to argument: people will hear of the drain and stay away. Were the number of sanatoria in India large this result might be viewed with complacency. As a matter of fact, these are few and their decrease even by one is, in our opinion, much to be deprecated. We are averse, therefore, to a drainage outfall at the point proposed near the centre of the beach. On the other hand, if the combined system of surface drainage for sullage and storm water for blocks 1A and 1B is to be retained, an outfall into the sea is necessary. As a way out of the difficulty it has been suggested that the outfall sewer should be deflected further to the east so as to discharge into the sea beyond the Chakra Tirath tank as shown by the red dotted line in the map. By this means the objection would be reduced to a minimum and the sacred tank being on a higher level would not suffer. A similar concession to popular sentiment has also been made by Government at considerable expense in connection with the deflection of the western outfall from the vicinity of the Swargadwara. The proposal appears to be the best solution of the difficulty but we are unable to recommend that it should be carried out. The already shallow gradient of the sewer would be dangerously reduced, the expense would be great and, we are informed, a successful issue would be doubtful. We have carefully considered the whole problem in all its bearings and are convinced that the difficulty will best be overcome by a separate system of sewerage for the sullage of the town. This we have strongly recommended on other grounds. The present main outfall drain for the Bara Danda would then be reserved for storm water only and, with the exception of the first washings after rainfall, might be allowed to discharge its full contents into the Banki Mohan Nullah with impunity. The first washings would be treated on land along with the sewage.

Only one point remains. At present the eastern surface drains are working and the sullage collects and stagnates in the lower reach of the main outfall drain. Some temporary expedient for its disposal is necessary. We would recommend that the main drain be tapped and the sullage led into a sump close to the Khas Mahal trenching ground and be thence pumped on to the land.

86. The domestic water supply of Puri is chiefly from wells, tanks and **Water supply.** to a less extent from the Matia River.

(a) The sub-soil water level is very high in the town and as usually happens where this is the case, wells, both **Wells.** public and private, are very numerous: in

some parts water is reached at a depth of from 5 to 6 feet from the surface and almost every house has its own shallow well. None of the private wells that we saw could be described as good. Many were protected from surface contamination by a plinth and parapet, but in nearly every case the cylinder consisted of superimposed narrow rings of laterite or baked clay with open joints between. As almost all were sunk close to latrines or cesspools free percolation from the polluted sandy soil must have been constant. The public wells, of which there are just over 100 distributed as shown on the map, were as a rule somewhat better but few of those we saw had good cemented cylinders. We have already described the condition of the conservancy arrangements throughout the town and it is obvious that contamination of the water in the public wells also must be frequent. Under the circumstances described it is little wonder that dysentery and diarrhoea are both rife amongst the inhabitants.

The necessity for improvement of the water supply has long been recognised and in 1908 a scheme was prepared for a **Water supply scheme.** pure piped water supply from a range of 5

wells which were to be sunk on a plot of land to the north-east of the railway station. The daily supply was to be 3,50,000 gallons (10 gallons per head of the resident population) and was estimated to cost Rs. 2,97,186 for construction and Rs. 10,000 annually for maintenance. A grant of Rs. 1,00,000 was given by Government towards the scheme and Rs. 25,000 was contributed by the Lodging House Fund. An appeal for subscriptions was also issued to Hindu Princes and

Noblemen but this met with only a feeble response, the subscriptions received, or promised amounting to Rs. 17,690. Work was started but the site proved unsatisfactory and a new site was chosen to the south-east of the railway station. At the same time the scheme was revised and a filtration gallery was substituted for the wells. The cost of the revised scheme for the same quantity of water was estimated to be Rs. 4,14,000. A series of experiments have been made to test the quality and quantity of water available at the new site and also the relative merits of a filtration gallery and three different types of the wells. These tests we understand have proved satisfactory and the scheme should now be taken in hand as soon as possible. The municipality, however, should be in a position to insist on the closure of defective wells, and this it can only do if the water supply is an ample and full one. We would strongly recommend, therefore, that the project should be drawn out on the basis of a daily allowance of 20 gallons per head of the resident population with a reserve of half that amount in addition for the extra population at an average festival.

(b) There are six sacred tanks but only four of these—the Indadyumna, the Narendra, the Markanda and the **Sacred tanks.** Swetganga—are in regular use as sources

of water supply, the other two—the Chakra Tirath and the Parvati Sagar—being at some distance from the inhabited area are freely resorted to only during the festivals. The four first named are all unreserved and are in constant use for bathing and the washing of clothes. The organic pollution which takes place during the festivals is naturally very great and the water of all of them at those times is quite unfit for consumption or for domestic use. In the case of the Narendra and Swetganga the contamination is specially dangerous and a sample of water from the latter sent for analysis to the Chemical Examiner was pronounced by him to be "liquid sewage." For some years a wise rule has been in force during each festival whereby a policeman is stationed at each of these four tanks to warn the people not to drink the water and to prevent them carrying it away to their homes. But it must be remembered that the tanks are considered sacred by the pilgrims and in spite of warnings the waters are drunk freely: in several instances attacks of cholera are said to have been traced to their use. Prohibition, therefore, while tending to mitigate the evil, can never be considered a real remedy. At the same time it is liable to be misunderstood and to be resented by the pilgrims who, quite naturally, think it a great hardship to be forbidden some of the religious ceremonies they have come so far to perform. With the tanks as they are, the present orders are certainly needful and should be continued but we would urge that in the case of the Narendra and Swetganga tanks at least, the two most sacred and also the most dangerous, steps should be taken for their improvement so that prohibition of their full use may become no longer necessary.

1. The Chakra Tirath Tank (photograph A, Appendix XLII).

This tank marks the spot where according to tradition the image of Jagannath was washed ashore. The pilgrims come to it to bathe and also to perform the ceremony of sraddha. It is a small shallow pool excavated in the sandy bed of the Banki Mohan Nallah close to where it enters the sea and is probably the least dirty of all the sacred tanks. If thoroughly cleaned out before each festival, as can easily be done, nothing more should be required.

2. The Swetganga Tank (photograph B, Appendix XLII and Appendix XLIII).

This is a small deep masonry tank in the centre of the town and is said to have been used by pilgrims for religious ablution and purification for seven centuries. Besides being the oldest and most sacred of all the tanks it is also the dirtiest. It lies at the bottom of a deep hollow and used to receive surface drainage from the surrounding inhabited area. It is much silted up with decomposing mud and the water not only looks dirty but smells of decomposition.

The use of this tank by residents and pilgrims has always been a source of grave anxiety to the authorities and for some years past a policeman has been stationed by it all the year round to warn people against drinking the water and to

prevent them carrying any away. In 1904, a pump was erected at one end to pump water for drain flushing and it was hoped that this would have a good effect. Little, if any, improvement, however, has been effected. The water is probably too dirty for cholera germs to survive in it for long but there can be no question of its potentiality for spreading dysentery and diarrhoea. We consider the improvement of this tank a matter of very great importance and to that end would recommend that it be pumped sufficiently dry to allow of all the silt being thoroughly cleaned out; that the floor be then raised above spring level and paved with brick in cement, or cement concrete, in its whole extent with the exception of a central well; that the central well be enclosed by a low wall (3 feet above the paved floor) as shown by the dotted black lines in the plan, Appendix XLIII; that a tube well be sunk at one corner in the position of one of the present wells, and that the tank be filled to a depth of two feet by pumping from it. Emptying and refilling of the tank would have to be done at intervals and more especially before the festivals: the same pump would do for both purposes. We are convinced that nothing short of what we have recommended will ever be quite satisfactory and, as there appear to be no objections on religious grounds if a central well is left, and the cost would be well repaid, we would urge that it should be done.

3. The Narendra Tank (photograph C, Appendix XLII).

This tank which is situated on the northern border of the town is a broad open expanse of water 734 feet long by 873 feet broad and in appearance and surroundings is a complete contrast to the last. It derives its chief importance from a small temple built in the water, to which the proxy of Jagannath is brought for 21 days during the Chandana Jatra in April-May. Throughout this time large crowds of pilgrims are encamped on its banks.

The water is much less foul than that of the Swetganga, due to the greater purifying effects of the sun on a large open stretch of surface and also to the fact that it is connected to, and, during the rains, receives partial flushing from, the Matia River through a channel and sluice gate at its north-western corner. On the other hand it is the most frequented tank in Puri for bathing and washing, while at every fall of rain it receives much surface drainage, owing to the fact that on three sides its masonry walls do not quite come up to the level of the surrounding ground. For these reasons the tank is heavily charged with organic matter, full of algae and quite unfit to drink: moreover attacks of cholera are stated to have been definitely traced to its use in several instances. About 20 years ago the tank was partially dewatered and cleaned, and the residents of the town are very anxious that this should be done again but more thoroughly. This would be both difficult and expensive owing to its size. Much of the silt could, however, be removed by dredging, at a moderate cost. We would further recommend that its walls be raised so as to intercept all inflow of surface drainage. This would of itself make a considerable difference in the purity of the water but would probably not be sufficient. In addition, therefore, or as an alternative to this proposal, about a quarter of the whole area of the tank should be divided off by a low wall as shown by the black lines in the rough sketch Appendix XLIV and the floor of this portion should be raised and paved. It would then be possible, with a pump and tube well, to empty, flush and refill the part of the tank in common use as often as was considered necessary. To avoid marring the beauty of the tank the dividing wall should be only one foot above water level and, for the passage of the barge containing the god, plank sluice gates would have to be provided.

4 and 5. The Indradyamina and Markanda Tanks (photographs A, B and C, Appendix XLV).

These are both large open masonry tanks surrounded on all four sides by walls which effectually prevent the inflow of surface drainage, and the water is correspondingly cleaner: the Markanda has the further advantage of two inlets from the Matia River through which it can be partially flushed whenever that stream is in flood.

The only feasible method of improving these tanks would be, as in the case of the Narendra, by throwing a low wall across, at some little distance from the end with the chief ghat and temples; by raising and paving the portion divided off and

flushing it with water from a tube well. In neither tank, however, is this so important as in the case of the Narendra and Swetganga and we consider that attention should be directed to the two latter in the first instance.

6. The Parvati Sagar Tank.

This is the least important of all the sacred tanks. It lies on the extreme west of the town, close to the Lokenath temple, and is little used except during the festivals. It is small and dirty. Only two sides are of masonry and even these are in bad repair so that much surface drainage gains entrance. If the tank were cleaned and deepened by the removal of silt and all four sides built of masonry it would be a great improvement. This work, however, is of less importance than that recommended for the other sacred tanks.

(c) Besides the sacred tanks there are numerous others scattered all over the town with the exception of the **Other tanks.**

the most part shallow irregular excavations which have been made to procure mud for building purposes. They usually lie immediately behind the houses lining the streets and in this position have formed convenient depositories for all kinds of refuse: as a rule also they receive the household sullage and the drainage from the insanitary private latrines. A very common condition is that in photograph B, Appendix XXXIX, which shows the back view of two lodging-houses. The water of these tanks is much too dirty to be used for drinking but is in constant use for bathing and for the washing of clothes and the household kitchen utensils. In addition to the dangers which may arise from this custom the tanks are objectionable on account of the pollution they add to the subsoil water and as breeding grounds for mosquitoes. That the only thing to be done is to fill them in is obvious: how it is to be done is a much more difficult question. The method at present in vogue of filling in these tanks with solid heaps of rubbish and then spreading a little sand on the top is not good. Where the banks of the tank are high enough, the system described in the general part of our report should be adopted. In the majority of cases, however, this will not be possible, and either the rubbish should be incinerated before dumping, or the tank should be filled to ground water level with sand, and dumping, in alternative layers of rubbish and earth, done on the top of that. The most suitable type of incinerator would be that known as the Sialkot pattern.

(d) The Matia river is a slow flowing stream overgrown with reeds on the **Matia River.**

north-eastern border of the town and is used as a source of water only by the residents in its immediate neighbourhood. Its banks are much frequented for the purposes of nature in the early mornings and evenings and at our inspection were very dirty. It will be impossible to prevent the water of this stream from being taken both for drinking and for other domestic use, and special attention should, therefore, be given to the conservancy of its banks.

87. The distinctive feature of the pilgrimage to Puri is the *mahaprasad*, the sacred food which has been consecrated by presentation to Jagannath. Before

Mahaprasad. him all men are regarded as equal, and the outward sign of this equality is the fact

that all may eat this food together irrespective of caste distinctions. To eat the *mahaprasad* is one of the chief rites of the pilgrimage and no pious Hindu in good health would think of cooking his own food while at Puri. The conditions under which this food is cooked and sold are obviously of great importance with reference to the public health and more especially so, as certain abuses appear to be prevalent.

Owing to restrictions regarding entrance within the temple enclosure we were unable to make any inspection personally, but we had this done for us, and also made careful enquiries from the manager of the temple, and from many people familiar with the arrangements: a plan of the temple grounds prepared by Dr. S. N. Tiwary, Deputy Sanitary Commissioner, is attached as Appendix XLVI.

Mahaprasad really means any food offered to Jagannath, but popularly the term includes only cooked rice, dal and vegetables, puris and sweetmeats. These are prepared in the temple kitchens by the suars, the hereditary cooks of Jagannath, and taken by them in pots to the inner temple to be offered to the God. At this time no one must touch the pots except the suars and the priests, but immediately after the ritual of presentation has been completed the food becomes *mahaprasad* and may be touched by any one. Part is retained by the priests for themselves and the Raja of Puri and the remainder is offered for sale in shops in a part of the outer enclosure of the temple called the Ananda Bazaar. Many of the pilgrims eat it here; for others it is taken by the pandas' servants to the lodging-houses; a certain amount is also sold in shops in the general bazaar outside. The chief defects in the arrangements appear to be—

- (a) that the rice and dal sold are often old and stale;
- (b) that the food is served out to the buyers in broken pieces of old, and frequently dirty, earthen pots and that these are used over and over again;
- (c) that the pilgrims are allowed to dip their fingers into the food to take a little to taste before buying;
- (d) that the food is exposed in the shops in open trays without protection from flies.

The complaints that we received referred only to the two first named 'defects' (a) and (b).

(a) From our inquiries it appears that the *mahaprasad* sold in the Ananda Bazaar within the temple is usually fresh except for about two days during the Rath Jatra while Jagannath is being taken to the Gundicha-bari and when it is impossible to have fresh made. At the same time cases do occur fairly frequently when stale *mahaprasad* is sold in the Ananda Bazaar: in the shops in the general bazaar outside this is quite common.

In a warm climate like that of Puri cooked rice and dal, but more especially the latter, go bad very quickly. In 12 hours, decomposition is quite apparent, and on the second day both food stuffs are quite unfit for use and liable to set up diarrhoea even in the robust and healthy. The obvious way out of the difficulty would be for the pilgrims to refuse the stale food but we can expect little help from them: once bought they will eat it in whatever state it may be, it is holy food and not a single grain may be thrown away. The only thing to be done is to have strict inspection and the confiscation of all that is unfit for consumption. The manager of the temple would prefer that a time should be fixed up to which *mahaprasad* might be kept and still sold. This, however, would be unworkable in practice, as it would be impossible to certify exactly how long had elapsed since any particular sample of rice or dal had been cooked: it would also be unfair as the time for which either will remain good depends very greatly on details in the method of cooking.

(b) The Hindu is usually so careful about the cleanliness of anything his food may touch that the use of old potsherds for the *mahaprasad* is rather surprising. Originally the custom must have sprung from a belief that the food was too holy to be polluted by anything, and the perception by some astute shopkeeper of how this belief might be turned to his own advantage. It is said that even the bits of pots collected by the sweepers from the rubbish heaps are bought for this purpose and that they are used over and over again till by some accident they are broken into fragments: two of us saw a heap of old broken gurrahs collected in the Gundicha-bari and they certainly did not look over clean. This practice of using old pots exists inside the temple compound as well as in the shops in the bazaar, and steps should be taken to put a stop to it both by the manager and the municipality, the shopkeepers being required to use clean earthen pots or "danas."

(c) and (d). The custom of allowing all and sundry to dip their fingers into the food is not only disgusting but likely to spread disease as well. Even more so are the myriads of flies which, at certain times of the year, settle alternately on

the mahaprasad in the shops and the nearest surface drain or heap of rubbish and filth. From the hands as well as from the flies germs of decomposition are added to the food, and in many cases the specific germs of disease may be added also. Major Greig who examined a number of flies in Puri in 1912 found that they harboured the cholera vibrio both on their external appendages and in their alimentary tracts. The remedy is the same in both cases—better conservancy, so that the flies may be diminished in numbers, and protection of the food in fly-proof boxes or trays, as we have recommended earlier in our report for the food stuffs and sweetmeats in "halwais" shops. The kitchens also should be made fly-proof.

The recommendations we have made cover the four most important sanitary defects connected with the sale and distribution of mahaprasad in Puri, and to each of them the manager of the temple agreed. He, at the same time, expressed his appreciation of the benefits better sanitation was likely to confer on Puri as a centre of pilgrimage and his readiness, not only to have our recommendations put into practice, but also to welcome regular inspections of the temple grounds, the kitchens and the food all the year round, for which the temple funds would pay. We understand that he has since carried out his promise by selecting a man for the post of trained sanitary inspector and placing him on the temple staff. If the municipality will similarly fulfil its obligations, by suppressing the abuses connected with the sale of mahaprasad in the general bazaar, a definite improvement in the public health we consider may be confidently anticipated.

88. During our inquiries regarding the preparation and sale of mahaprasad **Sanitary defects in the temple** we obtained information regarding certain grounds which are deserving of notice and which might be easily rectified at very little expense.

(a) The wells are insufficiently protected and at least one of them in the **Wells.** Ananda Bazaar is much used by the pilgrims who come to eat the mahaprasad.

It would be a great improvement if they could all be covered over and have pumps attached. This we understand is impossible as there are very strong objections to the installation of machinery in any form within the compound. We would recommend that the wells should have their cylinders thoroughly pointed with cement and that they should be provided with efficiently drained plinths, with parapets round their mouths and with pulleys, ropes and buckets for drawing water.

(b) The kitchens are good but the drains outside are defective and attract **Kitchens.** flies : between the drains and the kitchen walls also there is a space which is much

used as a urinal. It is important that there should be no stagnation in the drains as the sullage from the kitchen consists almost wholly of rice-washings which decompose quickly. We would recommend that they be constructed of glazed earthenware half pipes laid in cement or of other impervious material such as Indian patent stone. They should also be placed close to the kitchen walls to avoid the intervening space being polluted.

(c) Near the kitchens are some houses for the cooks and other servants **Servants' houses.** which are stated to be in a very insanitary condition. These do not belong to the temple but it would be an improvement if they were acquired and removed, new houses of a good pattern being built in their place. The area around these houses and between them and the kitchens might also be paved with advantage.

(d) Several areas within the temple grounds are stated to be used for the **Pollution of certain areas.** purposes of nature. This pollution of the neighbourhood of the holy temple should

be stopped or, if it is not possible to altogether prevent the practice, the fact should be recognised and the erection of suitable necessities should be undertaken.

89. Puri has one municipal market built on an excellent site on the south side of
Markets.

ly occupied by a crowded bustee of tumbled down insanitary huts with a dirty tank in its centre. The tank having been filled in with sand and earth the huts were pulled down and the market built in their place. The site is central, and good rents are obtained for the shops and stalls, but the general condition of the market was unsatisfactory. It is in the form of a square. On the north side is a double row of shops ; those facing the main street are built of masonry, but the others, erected back-to-back with them and facing the market square, are thatch huts on plinths of bricks and earth. On the east a high wall inside of which is a row of dilapidated looking thatch huts used as Muhammadan restaurants and which face the market. The ground in front of these was dirty and untidy with sullage lying about in puddles. On the other two sides the square is open. In the central space are three large masonry plinths with corrugated iron roofs. Of these one is open and is used as a fish and mutton market : the other two are divided into stalls by matting partitions. The well is a shallow one having a cylinder of superimposed rings of baked earth and with no plinth or drainage : spilled water was lying round the well mouth in dirty pools. The latrine and urinal are in a separate enclosure on the south : at the time of inspection they were both clean but the stench given off by the whole enclosure showed that this was far from their usual condition.

The stalls and shops in the market are let out by auction and good rents are obtained. The municipality make a considerable profit on its outlay and the sanitary condition of the market might be expected to receive somewhat more care and attention.

90. Statistics showing the incidence of infectious disease in Puri during the years 1902-13 are given in Appendix

Infectious diseases hospital.

XXXVII. Plague is unknown and, though

a certain amount of small-pox occurs, it is cholera which is the disease of paramount importance in the town. The map, Appendix VII, illustrating the spread of cholera infection by rail from Puri during the Rath Jatra in 1912, and Major Anderson's table for the same mela in 1902, Appendix V, have already been referred to. Further statistics of this disease as regards the infectious diseases hospital and the town for the years 1910-14 are given in Appendix XLVII. Two points in this table are of special interest—the gradual improvement in the recovery rate in hospital and the high percentage of the total cholera deaths in the town which occur out of the hospital. The former is good evidence of the care and attention bestowed on the patients by the hospital staff, and augurs well for the future popularity of hospital treatment. The latter shows the large number of cases of cholera which still remain unisolated in houses in the town and act as foci for further spread of infection.

We were fortunate in visiting Puri during an epidemic of cholera and so being able to see the conditions obtaining in the infectious diseases hospital when it had a full, though not unusual, complement of patients. With these conditions we were far from satisfied. The area of the hospital compound is cramped, the accommodation for patients and staff deficient, and the buildings badly arranged, so that both the isolation, and the treatment, of the patients were being carried out under very great disabilities. The statistics show that the hospital is doing excellent work but this is in large measure due to the zeal and devotion of the Civil Surgeon and his staff who deserve the greatest credit for the results they have obtained. Still better results must, however, be got before the cholera infection now being spread from Puri to all parts of India can be considered to have been effectively dealt with and, to obtain these, considerable alterations in the hospital will be necessary. Our recommendations with this object are set out below.

(a) The hospital is situated on one of the main roads leading from the railway station to the town as shown on the

Site.

map, Appendix XXXIV. The site is a good

one, being sufficiently isolated and yet within easy reach of all those parts of the town most frequented by the pilgrims. In area, however, it is too small. A

plan showing its size and the general arrangement of the hospital buildings, as well as the houses in the immediate vicinity, is attached as Appendix XLVIII. From this it will be seen that the site is already overcrowded and there is no room for any further extension. If the recommendations we are making with regard to increase of accommodation, etc., are accepted, more ground will have to be acquired.

(b) There are two main wards, 80 feet long by 15 feet broad, of which one is for cholera and the other for small-pox, but both have frequently to be used for

Accommodation for the sick. patients suffering from the former disease. They have masonry walls and thatched roofs, and are built on raised plinths with cemented surfaces which drain to two cesspools in the rear: along the front of each is a verandah six feet broad. Each of these main wards can accommodate only 18 patients, even when the superficial area for each bed is reduced as low as 66 square feet, and to provide against fairly frequent emergencies, when the total number of patients exceeds 36, there are three grass sheds without walls and with mud floors which serve as extra wards. The latter are altogether unsuitable for the reception of sick. Moreover they are brought into use when the hospital is overcrowded and the staff therefore overworked and liable to be less careful, and, being badly placed and having only mud floors, they increase the difficulties of preventing infection just at the time when those difficulties naturally tend to be greatest. To avoid using them more than was absolutely necessary we found that the Civil Surgeon was in the habit of crowding the main wards to the utmost and also of keeping patients in the narrow verandahs. We recognise that this practice is the best under the circumstances, but at our inspection the beds were crowded closely together in both the main wards with only the narrowest of passages between, and every available space in the verandahs was also fully occupied. The difficulties and dangers arising from these conditions are obvious: not only is the discomfort of the patients greatly increased and efficient nursing and treatment rendered impossible but the risk of infection to the attendants is also intensified. More ample accommodation for the sick in the cholera hospital is certainly required: what the amount of that accommodation should be is a more difficult matter to decide. It is unfortunate that there is no record of cholera "cases" in Puri over a series of years on which an estimate might be based. The deaths reported in the town each month, however, during the period 1892-1913, are shown in Appendix III and if these figures are increased by 50 per cent. the numbers so obtained should represent fairly accurately the number of "cases" that occurred. These are given in Appendix XLIX. An examination of this table shows that during the 22 years there were over 36 "cases" of cholera in one month (the present hospital accommodation) on 68 occasions and over 80 "cases" on 33 occasions. From these figures it would appear that accommodation for 80 beds should suffice, if arrangements were made for easy extension when necessary, but that it would be unsafe to fix on any less amount or overcrowding, with all its attendant dangers and discomforts, would be liable to occur during one and a half months on an average each year. We recognise that the figures on which this estimation is based are calculated ones only, and that it would be unsafe to trust to them alone, but a similar result is obtained when the question is considered from quite a different point of view. At our inspection in July 1913 we found the hospital markedly overcrowded, although from Appendix XLVII it appears that 56.1 per cent. of the total deaths from cholera were then occurring in houses in the town. More than double the present hospital accommodation was necessary during that month, and Appendix III shows that cholera had been equally or more prevalent 15 times during the previous 21 years. Looked at from this point of view also a minimum of about 80 beds for cholera seems to be required. It is true that these figures refer to what has occurred in the past and that, if the recommendations we have made regarding conservancy, water supply, etc., are adopted, cholera should be much less prevalent in the future. But against this must be placed the results of Major Greig's investigations already referred to, and the fact that cholera convalescents will have to be detained in hospital much longer in the future than they are present. Taking a comprehensive view of all the facts we are of opinion that accommodation for about 80 beds would be a reasonable amount to provide.

For extra accommodation against any unusual epidemic that may occur we would recommend that each ward be built with verandahs 10 feet broad on all four sides. These could then be used for any extra beds required. There should also be, we consider, private accommodation for better class patients.

The present small-pox ward is not always available for cases of that disease. A smaller ward would be sufficient and it should be placed in a separate compound.

(c) The only accommodation for the staff in the present hospital is one building 20' x 16' which is occupied by

Accommodation for staff. a *dhat*, quarters for the sweepers and a

room for the cook. The rest of the staff live in houses in the town. This arrangement is not good. In the case of cholera sickness there are frequent crises when promptitude in the application of remedies is of the first importance, and for this reason alone the staff should be housed where they will be immediately available at any time. Moreover, as already noted, the attendants in a cholera hospital though apparently quite well are often "carriers" of the disease. For this reason also it is important that they should be housed at the hospital.

(d) There are two rooms each 12 feet by 10 feet for the accommodation

Accommodation for patient's relatives. of relatives who come as attendants on the sick. This is obviously insufficient. One

such room for every two beds should be given as a minimum.

(e) The present office is very small and might be enlarged with advantage

Office and waiting room. a separate room being added for the clerk

who registers the names and addresses of the patients admitted to the hospital and takes charge of their clothes and other property. There should also be a room where the friends of the patients coming to make inquiries may wait until they can be attended to.

(f) The existing dispensary is small and dark and situated very inconveniently behind the office. A more central

Dispensary. position would be better and attached to

it there should be duty rooms for the doctors and nurses.

(g) The store rooms attached to the dispensary are also too small. Large

Store rooms. quantities of such necessaries as blankets,

dholies, bedpans, feeding cups, &c., have to

be kept in stock against emergencies, and when the hospital is at all full the accumulations of property belonging to the patients take up a lot of room.

(h) During the epidemic of 1912 there were as many as 27 deaths in hospital

Mortuary. during one day and 10 deaths is no uncommon occurrence. A mortuary at least

twice as big as the existing one is needed.

(i) There is a good Thresh Disinfecter but it occupies the centre of the

Disinfecter. hospital compound. This with the incinerator and mortuary should be placed in

a small separate enclosure.

(j) The water supply is very unsatisfactory. It is obtained from three

Water supply. wells, only two of which have protecting parapets to their mouths, and none have

impervious cylinders. The ground water level is high—only 4 feet from the surface in the case of one well—and the water is drawn by a bucket and rope so that dangerous contamination may easily occur. Later, water will be available in pipes from the new town supply but in the meantime all three wells should be closed down and a new one sunk at the back of the hospital compound near the boundary fence: from this the water should be pumped to an overhead tank and thence be distributed in pipes.

The enlargement and improvement of the infectious diseases hospital in Puri we consider a work of great urgency, and we have therefore embodied our recommendations in a rough plan for a new hospital, Appendix L. In this plan none of the present buildings have been utilised. The only two which might have been retained are the present main wards but they are of an inconvenient width, unnecessarily broad for a single row of beds and too narrow for a double row: the plinths also are much undermined by rats and they have a very narrow verandah along one side only. To remodel them would be almost as expensive as to build new wards and their inclusion is therefore undesirable.

91. During our stay in Puri it was urged on us from many quarters that one of the most needed improvements in the **Roads.** town is the widening of the main roads.

With the exception of the Bara Danda all are very narrow and in many there are portions where two carts or carriages are unable to cross: during the festivals, they are so crowded as to become almost impassable even to foot passengers, and blocks in the traffic are frequent. The conditions are well shown in the photographs of two of the main streets in Appendix XXXVI: two important thoroughfares in process of narrowing are also illustrated in Appendix LI.

In most cases one or both sides of the streets are occupied, almost entirely, by houses built of split bamboos and mud with open waste spaces in the rear. In these circumstances it should be neither difficult nor expensive to broaden and straighten the streets, and the advantages are obvious. But certain risks are also involved and it is necessary that precautions against these should first be taken. The opening out of broad thoroughfares always tends to an increase in the number of masonry buildings and these are usually of more than one story in height. Puri is rapidly gaining a reputation as a health resort for cases of tuberculosis, and many people suffering from this disease are taking up their residence in the town. In the bamboo and mud huts good ventilation and plenty of light can easily be secured, but any great increase in the number of masonry houses with dark ill-ventilated rooms, such as would certainly be constructed under the existing building rules, would be fraught with danger to the general health of the town. Before embarking on any schemes of town improvement, therefore, we consider it essential that there should be satisfactory building bye-laws in force in the municipality.

92. At mela times the only covered accommodation for third class passengers waiting for their trains is in the pens and to

(a) **Railway Station covered accommodation.** these they cannot be admitted until they have booked: many of the pilgrims therefore may have a long wait in the open. During

the Rath Jatra of 1912 this defect was partially remedied by the construction of two temporary sheds each 100 feet long by 50 feet broad and the concession was much appreciated. We would recommend that these sheds, or larger ones if possible, should be made a permanent arrangement. Water should also be laid on and stalls for the sale of food should be erected near them.

The existing latrines are of a good pattern but there is not a sufficiency of seats. About 100 more are required and

(b) **Latrines.** the sweepers' huts should be erected close to them.

The eastern main outfall drain from the municipality passes across the railway compound and is much resorted to for

(c) **Open municipal drain.** the purposes of nature by pilgrims waiting for their trains. The sweepers also frequently save themselves trouble by throwing nightsoil into the open drain instead of taking it to the trenching ground. If the drain were covered over a great improvement would be effected and the municipality should be asked to have it done.

As we have already seen it not infrequently happens that pilgrims are attacked

(d) **Wheeled ambulance for removal of cholera cases.** with cholera while waiting in the railway compound. Such cases are taken to the

infectious diseases hospital for treatment and this we consider the best arrangement possible. If a wheeled ambulance were provided by the railway, and always

kept in readiness, the removal of the patients would be greatly facilitated and their comfort, and chances of recovery, be much increased.

B.—GAYA.

93. Gaya, like Puri, is the administrative headquarters of a district and a **General.** municipality, but is a much larger town. Its

population at the last census in 1911 was 71,400 and its average annual income for the last five years, exclusive of grants and contributions, has been Rs. 1,30,181. The incidence of taxation in 1913-14 was Rs. 1-11-11. It is a considerable centre of trade but has no manufactures of any importance.

The town, of which a map is attached as Appendix LII, is situated on an irregular rocky ridge on the left bank of the Phalgu River, with the exception of two small suburbs on the right bank which are practically separate villages. The town proper may be divided into two portions—the old town of Gaya to the south and Sahibganj to the north—which, though continuous with each other, are quite distinct in their general characteristics. The former is the part more closely associated with the religious life and history of the town and contains the sacred Vishnupad Temple and the Akshayabat or Undying Banyan Tree. Like most old Indian towns it consists of a close and irregular aggregation of lofty masonry houses separated by a labyrinth of narrow winding lanes and alleys many of which are steep as well as tortuous. It is in this portion of the town that most of the lodging-houses are and that the majority of the pilgrims stay during their visit. Sahibganj is the business quarter and is inhabited principally by all classes of merchants, traders, artisans, money-lenders and professional men. It is of much more recent origin and had originally been well laid out in rectangular building blocks separated by broad open streets. The wide thoroughfares remain but, in the absence of building rules of any practical value, every available yard of ground between the streets has been built over, and the same conditions of congestion and dark narrow gullies as in the old town have been produced. The Phalgu River is subject to high floods but, at other times, dwindles to an insignificant stream meandering over a wide sandy bed dotted here and there with shallow, semi-stagnant pools. Opposite the town the river bed is over 900 yards wide.

94. From ancient times Gaya has been held in deep reverence by Hindus all over

Importance as a religious centre. India, and its importance as a great place of religious pilgrimage dates back to an early age. According to Hindu belief the town is endowed with special sanctity and the performance of "sraddha" at its holy shrines not only brings personal merit and absolution from certain deadly sins to the individual pilgrim, but also frees the souls of his ancestors from hell and gains for them instant admission into heaven. To save the spirits of the dead from torment is the first duty of a son, and it is therefore incumbent on every pious Hindu to go to Gaya at least once during his lifetime.

The full ceremony of "sraddha" involves a visit to each of 45 separate shrines or Vedis in and around Gaya. Their position is shown in the map, Appendix LII. Many of these shrines, however, are of little importance and, in any case, it is not every pilgrim who can spare the time and money which would be necessary for all of them. Three visits only are absolutely essential—to the Phalgu River, to the Vishnupad Temple and to the Akshayabat—and a large number of the pilgrims content themselves with this abridged ceremony. These three places are of special sanctity and all lie close together within the town of Gaya itself.

The "sraddha" at Gaya is said to be equally efficacious at all times of the year and the stream of pilgrims never really ceases. There are three seasons, however, when the pious flock into the town in greater numbers—the months of Asin (September-October), of Pus (December-January) and of Chait (March-April). Pilgrims from the north-west and west of India come chiefly in Asin and those from Bengal in Chait. The former is usually esteemed the more auspicious month but considerations of convenience and the times of the chief harvests probably regulate the seasons for different localities more than anything else. Be that as it may, the

largest crowds occur in Asin, and during this month more than 100,000 pilgrims are frequently to be found in Gaya at one time. It is estimated that the total number of visitors to the town each year is not less than 600,000.

95. Gaya is much less notorious than Puri as a distributing centre for cholera.

Prevalence of cholera, dysentery and diarrhoea. This is probably due to some extent, to the fact that the Gaya pilgrimage is frequently

made on the return journey from Puri, and when asked whence he has come, the pilgrim naturally gives the name of the more famous place of pilgrimage. The table of mortalities in Appendix XIII, however, shows that, not only cholera, but also dysentery and diarrhoea, are constantly and excessively prevalent in the town. It is obvious that Gaya must exert a considerable influence in spreading all three diseases amongst the pilgrims and through them to all parts of India.

96. The conditions as regards accommodation for the pilgrims are somewhat

Accommodation for pilgrims. different at Gaya from those elsewhere. For

the due performance of "sraddha" not only are the ministrations of a panda or Gayawal necessary, but his blessing at the end of the ceremonies is also absolutely essential. The Gayawals, therefore, assume complete charge of the pilgrims from the time of their arrival till their departure and put them up in lodging-houses which they either own or are interested in. Dharamshalas are of small importance and pilgrim shelters such as we have recommended for Puri would be of little use.

97. There are only two dharamshalas in Gaya freely open to the public—one

(a) Dharamsalas. close to the railway station and the other near the centre of the town. Both belong to the

same owner and are privately managed. They are excellent institutions in every way and we understand that since our visit, arrangements are being made to have them endowed. The other dharmshalas, of which there are several, are semi-religious institutions frequented chiefly by the members of particular sects and by sadhus. They are reported to be somewhat defective as regards sanitation but we were not allowed to enter and inspect them.

98. In Gaya it is the lodging-houses which are of greatest importance and the

(b) Lodging-houses. number licensed during the last three years, and the accommodation provided, are shown

in Appendix XXXVIII. Unfortunately their general sanitary condition at the time of our inspection was far from satisfactory. The majority are old private houses in the central and most congested parts of the town, and possess in a marked degree the various defects referred to earlier in the general part of our report. Nor will a remedy be easy. The houses are built of masonry and the reconstruction necessary to admit a sufficiency of light and air would, in most cases, be difficult: in some it would be quite impossible. Two important improvements, however, at once suggest themselves. Gaya is provided with a piped water supply and will soon have a sewerage system: piped water should be laid on to the lodging-houses, and water-flush closets, connected with the sewers, should be substituted for the present dark and insanitary privies. Much might also be done by regular and systematic inspection. At present there are two whole-time lodging-house inspectors and during the larger festivals extra assistants are employed to help them. Even the permanent inspectors, however, are untrained, have no clear idea of their duties beyond the detection of overcrowding and apparently work without method. Overcrowding is certainly an important danger but it is one which can be vastly lessened by clean and sanitary surroundings and much more attention, than at present, should be given to the conservancy of the lodging-house, to the detection of infectious sickness and to disinfection.

It is obvious from the table, Appendix, XXXVIII, that the accommodation for pilgrims must be deficient at all the chief festivals and that overcrowding in the licensed houses and the unlicensed keeping of lodgers must both be common. Each of these questions we have already discussed fully and, as in the case of Puri, we recommend a freer issue of excess and temporary licenses.

99. Part IX of the Municipal Act has been applied to the whole town, with the exception of a few outlying portions, and practically all the conservancy arrangements

are in the hands of the municipality. At the time of our inspection these were in many respects defective. Since our visit, however, a health officer has been appointed, and he has relieved the Municipal Secretary of the charge of the conservancy staff. It was obviously impossible for the latter officer, in a large town like Gaya, to be able to spare the time which this extra duty required but, with a full-time officer to supervise and control the staff and work, considerable improvements in the conditions may be anticipated. Further advances may also be expected as soon as the sewerage system now under construction can be brought into use. Only a very short description of the conservancy, therefore, is necessary.

100. The number of private privies is said to be 8,300. They are of various patterns but few can be said to be of a good

Private conservancy. type: many are situated on upper stories

with a long shoot to ground level: in others access for cleaning can only be got by creeping through a low tunnel. They are supposed to be cleaned daily but, at our inspection, many had obviously not been touched for days. The filth is collected by the sweepers in baskets and carried to one of the two nightsoil depôts shown in the map, Appendix LII. This gives rise to considerable nuisance but will be much mitigated when the new water-flush depôts have been constructed and connected to the sewers. As soon as the latter are in working order an attempt should be made to get as many of the private latrines as possible converted to a water-flush type.

Much of the household sullage flows directly into the old sewers of which there are a considerable number especially in the old town: much also passes into the roadside drains: some is collected in cesspools and removed by cart.

Refuse from the houses and shops is thrown into the streets or deposited in large cylindrical dust-bins made of corrugated iron. These are too few in number, are mostly old and broken, and are without tops or bottoms. Smaller dust-bins, of a size that could be lifted by a sweeper when full and emptied into the rubbish cart, would be found more convenient and should be substituted for those at present in use. Many more are required and they should have bottoms and be provided with covers.

101. There are thirty public latrines distributed in pairs as shown in the map.

Public conservancy. They are all hand-served and the filth from

them is carried in baskets to the two nightsoil depôts and there emptied direct into the wagons, or stored in covered buckets, till the following morning. From the nightsoil depôts the filth, which has been collected from the public and private latrines during the morning and the previous evening, is removed each forenoon to a trenching ground to the north of the town by steam tramway. This method of storage and removal has been the cause of much nuisance but the present depôts, the steam tramway and the trenching ground can all be got rid of as soon as some of the water-flush nightsoil depôts and the out-fall portion of the sewerage have been completed. As the sewerage is extended, and the public latrines converted to a water-flush type, all cartage of sullage and urine, which are now taken from the public latrines and private cesspools to a tipping place on the bed of the river, will also become unnecessary.

Surface sweeping is generally well done but in the old town there are many tumble-down and ruined houses which are used as latrines and also for dumping refuse. These should be cleaned and, as most of the owners are said to be poor, the work might well be undertaken by the municipality. Rubbish, street sweepings and silt from the drains, are collected in carts and tipped in various tanks and hollows. An improvement in the present methods of doing this has already been referred to in the general part of our report.

102. The permanent conservancy staff and plant are shown in the statement, **Staff and plant.** Appendix XVIII. In Gaya supervision of the staff is much better provided for than in

Puri and the chief defect is the small number and poor pay of the jamadars. There should be at least one for each of the 10 wards into which the municipality is divided. For efficient supervision the number of sanitary inspectors should also be increased to five.

The ratio of sweepers, excluding those employed on the drains, to permanent population is 1 in 150. Later when the sewerage system is in full working order and the public latrines and nightsoil depôts have been increased in number, this staff would probably suffice but it is too small for the present conditions, especially as many women and children are employed.

Another apparent defect is the small number of rubbish carts. The usual standard for efficient refuse removal is one cart per mile of population and, in a town like Gaya which is liable at any time to the influx of large numbers of pilgrims, a lower standard should not be adopted.

103. Extra sweepers are difficult to obtain in Gaya and the only additional con-

Special arrangements for melas. servancy staff employed during the melas is, two conservancy inspectors on Rs. 15 per mensem and 25 sweepers on Rs. 5 and Rs. 4 per mensem, for the area where the pilgrims stay in greatest numbers, and 5 sweepers on Rs. 6 per mensem for the cholera hospital. We have already noted that the permanent staff is too small for the ordinary population of the town and this is an obviously inadequate addition for melas which may be attended by over 100,000 pilgrims. The conservancy of Gaya at such times must necessarily be very defective and it is fortunate that a sewerage system is under construction.

104. A large portion of Gaya is already provided with surface drains and sewers

Drainage and sewerage. which receive most of the sullage and discharge it into the river. As, however, the system was incomplete, the drains and sewers old, many broken and of a bad type, and the outfall into the river in front of the temples and ghats objectionable, a new scheme of drainage and sewerage was prepared, received the sanction of Government in 1911, and is now under construction. Of the urgent necessity of the work there can be no doubt. The main object of the present scheme is to intercept the whole of the dry weather sullage and sewage of Gaya, and a large proportion of the storm water, and convey them to a point about half a mile below the town and then discharge them over the sandy chur alongside the river. There are two main arterial sewers with the alignment shown in the map, Appendix LII. These are at present under construction but only one small portion of the system in Sahibganj is complete and working. As a result of our inspection we would make the following suggestions:—

(a) That work on the outfall and lower portions of the main sewers be pushed on first so that each section, as it is completed, may be brought into use, and public latrine and nightsoil depot connections may be made to it. If this were done all the expense of the tramway and of much of the carting could be done away with.

(b) That more, and longer, branch sewers should be constructed so that the street side-drains may be shorter and less deep. In the portion of the system which has been completed the side-drains are so narrow and deep that it will be difficult to keep them clean and in good working order. They will soon become unsightly and malodorous and be a prolific source of flies. Besides, branch sewers will have to be laid down sooner or later, if full use is to be made of the sewerage system and private privy connections are to be allowed. We would suggest that, at least in those streets where there are many shops, branch sewers may be constructed from the start, and that the side-drains be of the kerb-and-channel pattern. The initial cost will be greater but it will be cheaper, and much more satisfactory, in the end.

We are also inclined to doubt the wisdom of interposing septic tanks between the water-flush public latrines and nightsoil depôts and the sewers. They

do not appear to be essential to the scheme, and those of us who have had experience of septic tanks look on them as a frequent cause of nuisance, and consider it undesirable to have a large number distributed all over the town.

It may be now too late to eliminate them altogether but we advise that where possible the question of their further construction be reconsidered.

105. The water supply is partly from the newly opened municipal waterworks
Water supply. but also very largely from shallow wells, both

public and private, which are numerous throughout the town. The tanks and the river are not much used: the former are in nearly every case obviously foul, while the latter, even when in flood and close to the town, is at an inconvenient distance for the vast majority of the population.

106. Where, as in Gaya, conservancy and drainage have been consistently neglected for generations, the site must necessarily have become grossly polluted and the

ground water in turn takes this up. Even if the wells were of the best construction, and amply protected from surface pollution at their mouths, a water supply from them could never be considered quite satisfactory. This is evidenced in Gaya by the fact that few of the wells within the town are really sweet, while many are distinctly brackish, have been discarded by the people as sources of drinking water and are now used only for bathing and the washing of clothes. But the position is made still worse by the facts that the wells in Gaya are for the most part defective in construction or out of repair, are badly situated with reference to such sources of contamination as privies, cesspools and drains, and are insufficiently protected above ground and so liable to surface pollution. In our opinion there can be little doubt but that the wells are responsible to a very large extent for the high prevalence of cholera, diarrhoea and dysentery amongst the inhabitants, and that, from the point of view of the public health, it is highly desirable that they should be wholly discarded in favour of the piped water supply.

107. The conditions we have described have long been recognised and a project for a pure water supply scheme for Gaya was drawn up in 1894. This was re-

Water-works. vised in 1906 and again in 1909 and the final detailed scheme received the sanction

of Government in 1910: the works have been constructed and the supply is now in use. It is drawn from a filtration gallery 600 feet long in the sandy bed of the Phalgu River and from three wells on the bank. Last year about 300 feet of the gallery was washed away during a spate in the river. Similar damage to the gallery, however, is not likely to recur as a concrete wall has now been put in to protect it. The wells are 28 feet deep and, after pumping, water stands in them at a depth of from 10 to 13 feet below ground level. The water is pumped to two service reservoirs situated on Mangla Gauri Hill 160 feet above the average level of the town. The reservoirs are circular, are built of reinforced concrete and have a total capacity of 800,000 gallons.

The original estimate was for 12 gallons per head in the 24 hours for a population of 110,000 and, though the gallery and wells can give this amount, it has never been required. It is obvious that the water is not yet being used as freely as it ought to be. This is probably due to the fact that there are not sufficient standposts and no house connections. The piped water is universally looked on as excellent drinking water and is freely used for this purpose, but owing to the difficulty felt in drawing sufficient for all purposes when the standpost is at a distance, well water is still made use of where a well is more conveniently placed.

We would recommend that the piped supply be brought as near as possible to all parts of the town by making further extensions and increasing the number of standposts, and by giving house connections as freely as is compatible with the supply available.

The appreciation of the piped water supply to some extent is also interfered with by the fact that each time the river is in flood, the piped water takes on a milky appearance from very fine silt in suspension. With continued use this may gradually disappear but, should it not do so, we would strongly recommend that

more wells be sunk and that the supply from the gallery be discarded. As we have already noted the wells in Gaya are not good and it is of the utmost importance that the piped water supply should become popular.

As soon as the sewerage system is completed and brought into full use, a larger water supply will be required to provide for the necessary flushing. Another well will have to be sunk and we would recommend that, as an experimental measure, a deep tube-well should be tried instead of another shallow surface well similar to those now in use. In the United Provinces deep tube-wells have been very successful: their water also is absolutely free from any risk of pollution.

108. There are several tanks in Gaya which are more or less sacred and are visited by the pilgrims, but only two are much used for bathing—the Suruj Kund and Uttarmanus.

(a) The Suruj Kund (photograph A, Appendix LIII).

This is the principal tank and is visited by all the pilgrims who bathe and make offerings there before going to the Vishnupad Temple situated close by. It lies deep below ground level and has high masonry walls on all four sides: the bottom is very uneven and is formed of the natural rock. The tank communicates with the river when the latter is in flood but it can never be drained and, as the same channel to the river serves both as inlet and outlet, little change or purification of the water takes place. In the course of years much foul silt has accumulated and the water is very dirty and full of minute green algae.

The Gayawals and other witnesses who came before us in Gaya were unanimous in asking that something might be done to improve the condition of the water, and there can be no doubt that it is desirable on public health grounds. The tank, however, is large and deep and to empty, clean and refill it as often as would be necessary would be costly. Only the edges of the tank are used and we recommend (1) that the whole tank be emptied and cleaned out, (2) that a strip 10 feet broad all round the edge be separated off from the rest of the tank by a low wall, (3) that this smaller portion round the edge be paved and that it be emptied, cleaned and refilled from the piped water supply as often as required, the water pumped out being used as a flush for the sewers.

(b) Uttarmanus Tank (photograph B, Appendix LIII).

This tank is situated on the Gaya Road half way between the old and new towns and a short distance from the river. Unlike the Suruj Kund it is not used all the year round, but during Chait and Kartik it becomes the centre of two considerable melas and thousands of pilgrims then bathe in its water. There are masonry ghats on all four sides and behind these, houses and temples from some of which sullage flows into the tank: along one side at the top of the steps is a long covered pavement much frequented by sadhus and beggars and always littered with refuse. The floor of the tank is covered with a deep layer of foul decomposing silt and the water is exceptionally dirty. The only remedy is to empty the tank, clean out the decomposing silt, and raise and pave the bottom: it should then be filled with water from the pipe supply.

Three other tanks of less importance also deserve notice.

(c) Brahmasat Tank (photograph A, Appendix LIV).

This tank is situated on the southern border of the town and is one of the Vedis visited by pilgrims for the performance of *sradha*. Only the northern end and half of one side are built of masonry; the rest of the circumference is irregular and has natural shelving banks of earth. The tank could be much improved by completing and deepening the northern portion, the earth and silt removed being used with rubbish from the city to reclaim the remainder. The cost of this improvement would be covered by the value of the land reclaimed. The work, however, is not an urgent one.

(d) Baitarni Tank (photographs B and C, Appendix LIV).

This tank lies close to the last and though not a regular Vedi is visited by many pilgrims. The southern end and half of each side is built of masonry. The

tank receives much surface drainage and sullage at its northern end, and the water is very dirty. A great improvement could be easily effected by enclosing the southern end by a cross wall and reclaiming the northern portion. It is not, however, an urgent work.

(e) Ramsagar Tank (photograph A, Appendix LV).

This tank is not a regular Vedi but derives its importance from the fact that it is much used by the inhabitants for bathing and washing clothes. On three sides it is bounded by masonry walls but, on the fourth, there is strip of dry ground 100 feet broad, which has apparently been formed by silting, between the edge of the water and the boundary wall. Formerly deep, the tank is now much silted up and becomes very shallow in places during the hot weather; in the rainy season it is refilled with water, or rather with surface drainage and sullage, from the road side drain passing along its southern border. There can be no doubt that the tank is useful but its present condition is very unsatisfactory. It is too large to be filled from the piped water supply and we recommend that a small deep masonry tank be constructed of the size shown in dotted black lines in the plan, Appendix LV(a), and that this be kept supplied with clean water from the municipal mains: the remainder of the area should be reclaimed and kept as an open space and play ground for that part of the town. Should it be necessary to provide a tank in front of the temple on the northern border of the present tank this need not be large; it should be of masonry and be supplied with clean water.

109. For the pilgrim to Gaya the most important bathing place is the Phalgu River in front of the Vishnupad Temple.

Phalgu River.

When in flood the river flows close up to the temple steps, but at other times it may occupy any part of its very wide bed and leave a broad stretch of dry sand in front of the ghat. This is the normal condition during the greater part of the year and is shown in photograph A, Appendix LVI. At such times shallow tanks and channels are scooped out in the sandy bed of the river (photograph A, Appendix LVI) and in these the pilgrims bathe. The natural flow of water though slight is still sufficient to keep the pools fairly clean, even with considerable numbers of pilgrims bathing, unless the latter use them also for washing their clothes. This should not be permitted and separate pools and channels should be reserved for each purpose. The general conservancy of this part of the river bed should also receive scrupulous care and attention and a special gang of sweepers should be detailed to look after it.

110. In old Gaya there are many sewers and drains which discharge along the **Paving lanes and reconstruction of** river front. The highest of these is close **sewers.**

to Masan Ghat and, starting from this point, there meanders along the river front a stream of foul black sullage, at first small and insignificant but becoming larger and broader as it is joined by the discharge from other drains and sewers lower down. The condition is well illustrated in photograph B, Appendix LVI. Much of this sullage comes from a number of old sewers which pass along the numerous narrow lanes and alleys of the old town, and have connections with the houses on either side. These sewers are badly built, old and broken and are quite unsuited to receive sullage: in many cases they are full almost to the top with black decomposing silt and are the cause of much nuisance. Both on this account and because of the conditions produced by the discharge of sullage along the river front we consider that the reconstruction of these sewers should be taken up as soon as possible. We recommend that they be opened out, be thoroughly cleared of all silt, be provided with a new egg-shaped invert and be then left to act as storm-water drains: also that the sullage at present entering them be intercepted in pipe drains and be led back and discharged into the new main sewer.

Another reason for the recommendation we have just made is that, until work on these sewers is completed, no action can be taken with reference to paving the lanes. In some cases this has already been done, but in the majority no pavement exists or it has become much worn and broken from age. Narrow lanes are especially numerous in the neighbourhood of the Vishnupad Temple

and, as they are much used by the pilgrims and almost wholly shut off from the sun by the high houses on either side, the ground remains sodden and surface sweeping is difficult. In these lanes there is no wheeled traffic and it would be a great improvement to have them all paved with brick or patent stone.

111. Gaya has one municipal market situated in Halliday Road, a broad open thoroughfare in Sahibganj. It consists of

Municipal Market. a row of eight sheds on either side of the street which are let out as shops for the sale of mutton, fish, vegetables and general produce. Most of the sheds have plinths of mud edged with stone or brick, corrugated iron roofs and matting partitions between the shops: only two have tiled roofs, and only the mutton market has a paved floor. There are also many small subsidiary stalls by the road-side including one for the sale of fish. At the time of our inspection there was much rubbish lying about and the whole market had an uncared for and untidy appearance: many of the shops were swarming with flies.

Proposals have been put forward to build a new market at a cost of Rs. 1,50,000 on an open piece of ground on the edge of the river at Ramna, and to gradually do away with the present market when the new one is ready for occupation. In favour of this scheme it is argued that the erection of a market in a public street is wrong in principle, that the present site in Halliday Road is cramped by two temples which obstruct the traffic along the sides of the street and so prevent the centre being used for the erection of shops, and that the new site is nearer, and would be more convenient, to old Gaya where most of the pilgrims stay. With reference to the first of these arguments it must be admitted that, as a rule, the building of a market in a public thoroughfare is undesirable as tending to congestion of traffic and to the exclusion of a proper amount of light and air. But Halliday Road may be considered an exceptional case: it is unnecessarily broad for the traffic which passes along it and, without the market, would be needlessly expensive to keep up, while, if the shops erected are of one story only, the street is so wide that no objection to them need be raised on public health grounds. The temples are certainly a drawback but they do not interfere with shops on the sides of the streets as at present. The third argument of convenience to the pilgrims and to the inhabitants of old Gaya is also of little weight: their convenience would be much better suited by a second market in old Gaya itself. On the other hand many excellent markets built on apparently unexceptional sites in different towns in India show that the moving of a market is not to be lightly undertaken. Custom dies hard and associations are not soon forgotten in India: the new market without these, but with everything else apparently in its favour, frequently remains empty while the old one, with all against it, prospers as before. The Halliday Road market is popular and the shops fetch good rents. In our opinion the advantages to be obtained from a removal to the proposed site at Ramna are not sufficient to warrant the risk that would be taken. We recommend that the present site be retained but that the sheds be replaced by others with solid masonry plinths, brick walls and partitions, and tiled roofs: also that a good central site be selected and acquired for a second market in old Gaya.

112. Statistics showing the incidence of infectious disease in Gaya during the years 1902-1913 are given in Appendix.

Infectious disease.

XIII. Plague, cholera and small-pox have each been prevalent during that period, the average annual number of recorded deaths having been 725, 458 and 82 respectively. Further statistics regarding cholera in the infectious diseases hospital are given in Appendix LVII. Both as regards recovery rate, and the percentage of total cases admitted to hospital, Gaya compares unfavourably with Puri.

(a) The routine for the detection of cases of cholera in the lodging-house, and for preventing the spread of infection, appears to be carried out very laxly in Gaya.

Reporting of cases of cholera in lodging-houses.

The police receive from the lodging-house keepers reports of deaths only and not of all cases of serious sickness as is required by the Lodging-House Act. The reports of deaths are sent to the Civil Surgeon each morning. The Sub-Assistant Surgeon in charge of the infectious diseases hospital also sends a statement of

the cases he has admitted the previous day. It is from these belated reports at the Civil Hospital that the Lodging-House Inspectors get their information. The latter then visit the lodging-houses where cases have occurred, give orders for disinfection, return later to see that this has been carried out, and then shut up the whole house. The defects of this procedure are obvious; that which we recommend should take its place has already been fully described in the general part of our report.

(b) The infectious diseases hospital, of which a plan is attached as Appendix LVIII, lies on the south-western border of the town. The site is a convenient one

for old Gaya but is too far from Sahibganj and the Railway Station, more especially as there are no wheeled ambulances for the conveyance of the sick. The latter are certainly required.

Passing through the hospital compound are three large open storm-water drains and into them is discharged all the sullage of the hospital and of the bustee on its northern boundary. For this the drains are in no way suited and at our inspection the outfall was full of black decomposing silt.

In addition to quarters for the staff, a cook house, a mortuary and a latrine, there are three main buildings. One of these is used as a dispensary and office, another is divided into three small wards each containing 4 beds, and the third into two wards for 8 and 4 patients respectively. The question of accommodation for infectious sick we have already discussed fully in the general part of our report, and also in connection with the hospital at Puri, so that it is unnecessary to go into the matter again here; moreover 24 beds is obviously much too small an allowance for Gaya. An extension is urgently needed and space for this could be obtained by acquiring the garden plot on the east of the hospital compound.

The water supply is from a well. This is undesirable when a pure piped supply is available. The municipal main passes quite near and water should be laid on to the hospital from it.

The present arrangements for disinfection should also be improved. Cholera stools are boiled in a small bucket! Clothes are disinfected by boiling in a small open tub, or by soaking in phenyle, or perchloride of mercury solution, in galvanised bath tubs. We would recommend that an incubator and a steam disinfector be supplied.

113. The burning ghat (Masan ghat, photograph B, Appendix LV) is situated about 150 yards up stream from the Vishnupad Temple and the most sacred part of

the river. The site is obviously a very undesirable one, but it has the authority of long use, and any attempt to remove it would excite violent opposition, and almost certainly end in failure. All that can be done is to see that it is kept in as good order as possible.

During the rainy season each year the front of the ghat is scoured by the river and the earth washed away is usually replaced by rubbish brought from the city. The whole ghat has fallen into a very dirty and insanitary condition and this is intensified by a large drain discharging foul black sullage just above it. The drain should be diverted into the new sewer, and either the front of the ghat should be built of masonry, or be protected from the force of the stream by a groyne projecting into the river just above it.

At other times the ghat is left high and dry as seen in the photograph and then the corpses have to be washed in shallow holes in the sandy bed of the river. It was suggested to us that this practice was dangerous and that masonry tanks containing water and a disinfectant should be provided. We are very doubtful of the usefulness of this suggestion, and consider that any risk to the bathers down stream could be more easily obviated by selecting and marking off for the bathing and burning of corpses an area in the river bed which would not be directly up-stream to any of the bathing pools.

114. Gaya is singularly unfortunate in having no good road to the river in the vicinity of the Vishnupad Temple. It is here that bathing brings special merit, but all the

approaches, with the exception of the Masan ghat road, are unsuited to wheeled traffic and, during the festivals, it is often a matter of the greatest difficulty to effect a passage through the crowds, even on foot. The road to the burning ghat is also narrow and tortuous, but it would be possible to widen and straighten it at no great cost. The improvement would be very popular and would also facilitate the regulation of traffic to the river and temple during the festivals. Moreover the increase in value of the land on either side of the road would be considerable and, if a good broad strip were acquired, most, if not all, of the cost of the scheme should be recovered. We recommend that this improvement be under-taken.

115. The water supply at the railway station is pumped from a well in the bed of the Phalgu River below the town. A well

Railway Station.

(a) **Water supply.** in this situation must necessarily be exposed to the risk of sewage pollution and we consider that arrangements should be made to give water to the platforms, waiting sheds, etc., from the municipal supply.

Any cases of infectious disease found on the railway premises or in trains are sent to the civil infectious diseases hospital.

(b) **Wheeled ambulances.** This we consider a better arrangement than

that the railway should build and equip a hospital of its own. The distance, however, is great and a wheeled ambulance should be provided for the conveyance of the patients to hospital speedily and in comfort.



PART IV.

FINANCIAL.

116. Throughout our report we have made numerous recommendations for the improvement of the health conditions of the various places of pilgrimage we visited, and many of these will involve the expenditure of large sums of money, both for initiation and for maintenance. The details of financial ways and means did not fall within the scope of our investigations, but our report would be incomplete did it not contain some general reference to the subject. More especially is this the case as one aspect of the question—the necessity of placing on the pilgrim some part of the burden of cost—was repeatedly impressed on us during the whole course of our inquiry.

(a) Earlier in our report we have shown the supreme importance to India of thorough sanitation at all places of pilgrimage. We have also pointed out how defective, in many cases, the present conditions are and that adequate sanitation will mean, amongst other things, the introduction of piped water-supplies, the construction of drainage or sewerage systems, the improvement of tanks and bathing ghats, the building or enlargement of hospitals for infectious disease, and the maintenance of larger, better qualified and better paid, health, and conservancy, staffs. For these and for other changes indicated in the body of our report, a substantial initial outlay, as well as a steady income for maintenance, will be necessary. Normally these charges should be met from local funds, but, apart from their religious associations, most of these places of pilgrimage are small and of little importance and comprehensive schemes of sanitation would be far beyond their resources. Besides, it would be manifestly unfair that all the charges for improvements, which, admittedly, are chiefly required for the protection of the neighbouring districts of the province, or of India as a whole, should have to be paid for solely, or even chiefly, by the local inhabitants. The latter it is true will also be benefitted and should therefore be required to pay their share: but to ask them to pay the whole would be unreasonable, and must delay the inception of the improvements indefinitely. In our opinion a fair division of the bill would be that all charges for initiating the schemes should be provided by grants from the Local or Imperial Governments and that the charges for maintenance should fall on the local inhabitants and on the pilgrims.

(b) In considering the question of taxation of the local inhabitants it is necessary to inquire whether that taxation should be general, or whether there are any classes who derive special advantages from the advent of the pilgrims and on whom therefore the burden of taxation should fall. Of the latter there are two—the pandas and the lodging-house keepers. Both these classes gain from the pilgrims in a special degree: it is, indeed, on them that they live.

We had abundant proof during our tour that the pandas, as a class, make a considerable income from the pilgrims. While many of these priests are good and honourable men, taking only what is willingly given in charity, it is unfortunately true that the majority of the class are distinguished chiefly by their rapacity, and at every place of pilgrimage the ignorant and trusting pilgrims are made to pay to the uttermost farthing for the religious ministrations they receive. The army of touts that flock to every pilgrim station to meet the incoming trains shows how keen is the competition to gain possession of the pilgrim, who is then, as a rule, squeezed dry before he is allowed to go. Many priests send their agents further afield to the main railway junctions, and often to scour the country generally. Were there any practical means of taxing this community of pandas such a tax would be in the highest degree equitable. But the influence of the pandas over the pilgrims is so great that, however lenient or fair the tax imposed, they would easily convince them that the levy was unjust and indefensible in the eyes of God; that it was in fact a tax on their religion. Moreover the pandas would probably take good care that the pilgrims not only paid the tax for them in full but a good deal more. Any direct tax on the pandas

would undoubtedly be very unpopular and we can suggest no effective method of indirect taxation.

Nor would we recommend special taxation of the lodging-house keepers. At present they are taxed under the Lodging House Act and a further tax would be undesirable. At the best it could only be small, and there is a good deal of danger that it would be unproductive also. Already infringements of the Act by evasion of registration and by overcrowding are common, and if a second tax were imposed, these would almost certainly become much more frequent: a large inspecting staff would be required and this would swallow up most of the proceeds. In addition night inspections would become more necessary than ever, and these we should like to see abolished if possible.

As no special taxation is possible, general taxation on all the inhabitants will be necessary. But for this there are good grounds. All of them gain, directly or indirectly, to some extent, from the advent of the pilgrims. In addition they will, as permanent residents, benefit most from the improved sanitary conditions to be introduced. It is only just, therefore, that part of the cost of the improvements should be recovered from them.

(c) Regarding the propriety of a tax on the pilgrims there can be no question. It is on their account chiefly

Tax on pilgrims.

that all the special preparations have to be made and precautions have to be taken, and it is only fair and equitable that they should bear a proportionate share of the expenditure which must be incurred. Nor, do we think, would the pilgrims object. At every visit to these holy places they spend money freely and it is all counted for merit. On the other hand their numbers are so large that even a very small sum from each would mount into thousands of rupees.

The justice and expediency of a tax on pilgrims is generally recognised: it

Method of collection.

has also in several instances already received the sanction of Government. It is the manner of collecting the tax which is the chief difficulty. Four methods have, at different times, been suggested:—(1) by a poll tax on the pilgrims at the entrance to the main temple, (2) by a tax on lodging-houses, (3) by a poll tax on the pilgrims at barriers on the main roads into the town and (4) by a surcharge on the tickets of all pilgrims coming to the town by rail. Each of these methods we have examined carefully. The first three we consider unsuitable but fortunately the fourth has much in its favour. सर्वामव नयन

A tax on the pilgrims at the temple gates would abolish the right of free

(1) at the gates of the temple.

admission to, and worship in, the temple, and, on this account alone, should be negated. In addition it has other disadvantages which would make it almost unworkable in practice. At all the larger festivals there are occasions, often lasting only a short time, when, on account of some special ceremony or some more than usually propitious conjunction of the stars, great importance is attached by the pilgrims to a visit to the temple. At these times the rush is great, and control of the crowd by barriers is frequently necessary if all are to be passed through the temple without accident. To attempt to distinguish between the taxable pilgrims and others, who had already paid at a previous visit, would be impossible, while to collect the toll from all who entered would give rise to much irritation: in either case serious interference with the speedy passing of the pilgrims through the temple would occur, and the risk of accidents would be great.

We have already given reasons why we consider another special tax on the

(2) through the lodging-houses.

lodging-houses undesirable. As a means of reaching the pilgrim this method of taxation would have a further disadvantage in that all pilgrims do not go to the licensed lodging-houses: as a matter of fact it would appear from the records of licensed accommodation available that the majority put up elsewhere.

The third method, that by a poll tax on the pilgrims at barriers on the main

(3) at barriers on the main roads.

roads into the towns, is also unsatisfactory and experience shows that, wherever it has been tried, serious difficulties have arisen. These may be briefly summarised as

follows. There are usually several main roads leading into the town and the number of daily arrivals by each, at ordinary times, is small. It would never pay to collect the tax all the year round and the levy is made for a few days only at each of the chief festivals. Most of the moharrirs have to be temporarily employed, and there is great difficulty in getting together a reliable staff. At the same time their opportunities for petty oppression and peculation are unrivalled, adequate supervision and control are difficult and the risk of detection is slight. It usually follows that the collecting staff make the most of the few days the festival lasts and abuse is the rule rather than the exception. Another objection is that the tax presses heavily on the poorest class of pilgrims and on all those religious mendicants who travel by road : the latter, who have taken a vow of poverty, carry no money, and they have to beg the amount of the toll before they can pass. Further, the cost of collection is heavy and the serious delay to, and interference with, traffic on the roads, make it unpopular. The tax was sanctioned for Hardwar in 1894 but was soon afterwards suspended on account of the trivial amount of the proceeds, the excessive cost of collection, and the fact that most of the pilgrims coming to the town by road were poor. It was formerly also in force in Puri but gave rise to grave abuse and was abolished by Government. At Ajudhya this form of taxation was imposed in 1870 but in 1875 was withdrawn as unsatisfactory, the reasons being, that it bore hardly on the poorest pilgrims and religious mendicants, that it was the subject of exactions by some of the officials collecting it, and that there was serious interference with traffic at the barriers. In 1905 the tax was reimposed and is still in force during the chief festivals. The working of the tax is described by the Municipal Taxation Committee, United Provinces, 1908-09, as follows :—

" Whatever may be the merits and demerits of a passenger tax, and these will be discussed later, we are unanimous in considering that the pilgrim tax, as administered at Ajudhya, is a serious evil. The method of procedure is to erect, a day or two before the festival, barriers on the roads leading to the bathing ghâts, and at those barriers to charge the toll on all arrivals. The administration of the tax is open to great abuse. The opportunities for peculation and oppression are numerous and the evil is complicated and accentuated by the fact that the staff is purely temporary. It is therefore more than usually to their interest to make as much as they can while the fairs are in progress. They have no permanent position to forfeit in case of detection, and the risk of detection is slight. Apart from this consideration, a large percentage of the visitors to the Ajudhya fairs are religious mendicants, who travel by road, and live on the charity of the countryside as they pass along. They carry no money, and unless helped by some charitable visitor who pays for them at the barrier, they are now unable to reach the bathing ghâts, and attain the object of their journey. We had unanimous evidence of the strongest description from all the witnesses in Fyzabad, to the effect that thousands of pilgrims have been compelled, during the bathing fairs of the past year, to remain on the other side of the river, as they have been unable to pay the anna necessary to enable them to pass the Lakarmandi bridge barrier. There are many arguments against the taxation of railway passengers, but the pilgrim who can afford to travel by rail, can also probably afford to pay an extra anna for admission to the fair. There is no such probability in the case of the pilgrim who travels by road. The cost of collection is also very heavy. During the last three years it has averaged 10 per cent. Last year it reached 16 per cent. Taking into consideration all the arguments for and against this tax, we are of opinion that a pilgrim tax collected at road barriers is not a suitable form of taxation." To obtain first-hand information, however, of the actual working of this form of taxation one of us paid a special visit to Ajudhya during the Ram Naumi Fair. At the first barrier he came to, he found a cart that had just been passed. On it was a party of five children and seven adults who had amongst them three tickets and three free passes. At the barrier in addition to the usual muharrirs and chaprassies there was a supervisor or inspector. This example is in itself sufficient to show how the tax is realised : to give further instances would only be unnecessary repetition. One other simple system of fraud, common at Ajudhya, may, however, be mentioned. The moharrir issues tickets to the pilgrims on the usual payment, a friend collects the tickets a little further on, and they are then re-issued to a fresh batch of pilgrims who again pay

for them. The risk of detection to the muharrir is small: the only person who might suffer would be the pilgrim who had bought and paid for his ticket and then returned it. On a full consideration of all the information before us we are forced to think that this method of taxing the pilgrims will always be unsatisfactory.

One other method of realising a tax on pilgrims remains to be examined: that by a surcharge on the tickets of all passengers coming to the town by rail. This system is already in force at Hardwar and Benares where it works smoothly and well. The tax is collected through the agency of the railway, one anna being added to the price of all tickets issued from beyond a certain radius to either of these two places. The result is a substantial increase of income to both municipalities, the average annual receipts being about Rs. 36,000 at Benares and about Rs. 35,000 at Hardwar.

(d) Before discussing the advantages and disadvantages of this method of taxing the pilgrims it seems necessary, to avoid any misunderstanding, that we should draw attention to what we consider an obvious improvement on the manner of collecting it at Benares and Hardwar. At present the surcharge of one anna is levied only on in-going tickets: it should be made on those of outgoing passengers also. The present arrangement, while reducing the proceeds by one-half, has the additional drawback that it brings the fact that he is being taxed, directly to the notice of each passenger and, to that extent, cancels one of the chief advantages of indirect, over direct, taxation. It also opens out an easy road to dishonesty for the booking clerk. The temptation is for him to charge an additional anna on all outgoing tickets: the ignorant pilgrim paying the same price for the ticket for his return journey as he did for the ticket with which he came, would never suspect that he was being robbed.

(e) The advantages of a tax levied through the railway may be summarised as follows:—

Advantages of a passenger tax.

(1) It is indirect and the payer is usually quite unaware that he is being taxed. Of the pilgrims and others who had been to Hardwar or Benares, and whom we questioned concerning the taxes at those places, the vast majority were in complete ignorance of their existence: those who knew did not seem to mind the payments they had made. On this point one witness, who opposed the tax on grounds of expediency and because of the feeling of irritation which it was likely to cause amongst the pilgrims, gave, unconsciously, good evidence. When questioned he had to admit that, though he was a frequent visitor to Benares, he had never known that he had paid the tax each time he had gone there.

(2) The collection is easy and inexpensive. The tax is included in, and paid with, the price of the ticket at the booking office and no extra staff is required. Nor is the accounts work of the railways appreciably increased. Already returns of all bookings to and from different stations are maintained for other purposes: from these returns the sums due from the railways are calculated, and the accounts are of the simplest.

(3) The tax is levied from those best able to afford it. The pilgrim who has the money to travel by rail can easily pay what is a wholly insignificant addition to the other expenses of his pilgrimage. On the other hand the very poor, who have perforce to travel by road, are exempt.

(f) Certain objections to this method of levying a tax on pilgrims were brought to our notice by different witnesses who came before us: others are adduced by the railway administrations, most of whom are strenuous in their opposition to a passenger tax in any form. It is necessary that each of these objections should be examined in detail. They may be stated shortly as follows:—

(1) A tax collected through railway tickets would not really be one only on pilgrims, but on all visitors coming to the town by rail : it would be unfair on those who came for trade or other business. To this objection we attach little importance. It would certainly be impossible in practice to differentiate between pilgrims and other passengers, and the tax would therefore have to be on both. But infection is not confined to pilgrims : other visitors run similar risks of contracting disease, and all would reap almost equal advantages from the improvements introduced by the proceeds of the tax. Only in the case of what may be called suburban traffic, that is of those people who live close to the place of pilgrimage and have to visit it very frequently in the ordinary course of business, might the tax be considered to press heavily. Later we are recommending, for other reasons, that, in imposing the tax, there should be an exemption area of 30 miles radius, that is that no one coming by the railway from within this radius should be liable to the surcharge. If this recommendation be accepted the only serious part of the objection would be removed.

(2) It was also pointed out that residents of the place of pilgrimage would have to pay doubly : that already they contribute to the cost of the sanitation of the town through the local rates and taxes, and that it would be unfair that, in addition, they should have to pay each time they left their homes by rail.

Against this small addition to his taxes we think the resident has little reason to complain. The new tax would relieve him of much of the burden of taxation that otherwise must fall on his shoulders : his occasional contribution of one anna can hardly be considered too heavy a price to pay for all the amenities which would be added to his town, most of which would be maintained by the proceeds of a tax almost wholly paid by visitors.

(3) A third objection, and one emphasised by the railway administrations, is that, unless a similar tax were imposed on all visitors coming to the town by road, the tax would really be one on railway traffic, a handicap on the railways in their competition with other forms of transport. The force of this objection must be admitted and provision must be made to avoid it. This can be done, and the objection be fully met, by having an exemption area round the place of pilgrimage with a radius of 30 miles. Beyond this distance the railway is much the cheapest mode of conveyance and would remain so even with the addition of the surcharge. The latter would have little influence in preventing any one from using the railway who otherwise would have done so, while those coming from beyond 30 miles, and using other forms of transport, must have a stronger motive for their preference than mere cheapness, and would be little affected.

(4) Another objection raised by the railways is that the careful and cautious pilgrim, getting to know of the surcharge on tickets for the place of pilgrimage, will take a ticket for one station short of his destination and walk the few odd miles to save his anna : for each pilgrim who did so the railway would lose the price of a ticket for the last part of the journey.

There is very little danger we think of this being done so long as the tax is included in the price of the ticket. As we have already said, few of the pilgrims know of the surcharge and, even if they did, it is exceedingly doubtful if any appreciable number would think it worth while to save an anna in this way.

(5) The main objection of the railway administrations, however, is that from their point of view the collection of a surcharge on the tickets to be handed over to any one else would be bad business. Fares are fixed, not out of charity, nor from sentiment, but on hard business lines. If they are too high the number of passengers will fall off, if too low the profits will dwindle. Every railway, therefore, endeavours to strike a mean, and fix on that fare which is calculated to give the best immediate or ultimate return. In these circumstances they object to any surcharge. They argue that, in the event of its being imposed, the number of passengers would decrease if the fares they had fixed on were the correct ones, or that, if the number of passengers showed no appreciable falling off, their fares had previously been fixed too low. As the main object of railway administration is to pay dividends, either event would be distasteful.

With this line of reasoning we are unable to agree. On similar grounds every improvement on the railways which did not show an immediate and direct profit would stand condemned. The argument is good so far as it goes, but it omits several points of vital importance. In the first place the pilgrim traffic is admittedly a source of considerable profit to the railways. It is to their interest, therefore, to develop that traffic as much as possible. Of late years a great increase in the number of pilgrims has taken place and, while much of this is due to the railways themselves, much must also be attributed to other causes, not the least of which are, the greater attention that has been paid to sanitation at the places of pilgrimage, and the lessened risk to life which has resulted. With further sanitary improvements a still greater popularity of pilgrimage may be confidently anticipated, and it is to their own interest that the railways should do all that they can to assist in bringing these about. A second point omitted is the losses which the outbreak of an epidemic at a place of pilgrimage may inflict on the railways. In every case this means additional expense and trouble and a diminished income. But not infrequently also Government is forced to forbid all railway bookings to a place of pilgrimage during an important festival. The resulting loss to the railways must be heavy, but this stoppage of booking should rarely, if ever, be necessary were the sanitation of the places of pilgrimage raised to an efficient level. A further point is the obligation that rests on the railways to help. We have noted how the railways have revolutionised the pilgrim traffic, and shown how disease is spread by them. For much of the urgency of sanitation at the places of pilgrimage they must indeed be held responsible: their obligation to assist, in every way they can, is correspondingly great. Further, it must be remembered that the railways profit largely from these pilgrimages and direct taxation on them would not be unfair. Lastly, the only alternative would appear to be the collection of a tax at the exit from the railway premises and this, for many reasons, would be undesirable.

To sum up, we are of opinion that, both from policy and as a matter of obligation, the collection of this surcharge by the railways can be justified, and we would strongly recommend that this method of securing an income for improving and maintaining the sanitation of places of pilgrimage should be adopted.

(g) From the recommendation we have just made there arise three further matters which require consideration—(1) the amount of the passenger tax, (2) the places for which it should be levied and (3) the administration of the proceeds.

(1) Both at Hardwar and at Benares the surcharge is levied only on incoming passengers and is at the rate of one anna on each full ticket, and six pies on a half ticket. We have already stated why we consider the surcharge should be made on out-going tickets also, but there should be no diminution of the rate on this account. The two annas which each adult would have to pay would be but a small charge for the extra comfort and safety he would obtain: it would moreover be a trifling addition to the total expenses of the pilgrimage and should not be grudged.

(2) In our opinion the surcharge should be applied in the case of all five places of pilgrimage that we have been considering—Gaya, Deoghur (Baidyanath), Puri, Sakhigopal and Bhubaneswar. For Gaya it should be on all outward and inward tickets with an exemption radius of 30 miles. In the case of Deoghur there should be the same exemption area, but the surcharge should apply also to Jasidih Junction. At the latter station all passengers to, and from, Deoghur, which is on a short branch line, have to alight and change trains. As the two places are close together and are to be connected by a good bridge road, many of the pilgrims might be tempted to do this part of the journey on foot or by ekka and this would be a serious handicap on the working of the branch line. On the other hand Jasidih is only a small village, and practically the whole of the passenger traffic to it consists of pilgrims for Deoghur and of the occupants of the numerous residential bungalows between the two places: the inclusion of Jasidih would therefore create no hardship. The pilgrimages to Puri, Sakhigopal and Bhubaneswar are closely associated, and practically all the pilgrims going to

the two latter places also visit Puri. To avoid the surcharge being levied more than twice, therefore, on any one person, that is once on the inward and once on the outward journey, all tickets between any two of these three places should be free of the impost. In the case of this pilgrimage a slight modification of the exemption area is also necessary. The main junction station for Puri is Khurda Road, 27 miles distant. Many pilgrims both coming to, and going from, Puri and Sakhigopal, book to that junction and then rebook onwards. It is obviously unfair that these people should escape the tax and we would recommend that this junction should be outside the exemption area for Puri and Sakhigopal.

(3) It is an obligation to the railways, as well as to the pilgrims, that the whole

The administration of the proceeds **of the tax.** **proceeds of the tax should be spent on improving the sanitation and general amenities**

of these towns regarded as places of pilgrimage: under no circumstances should any part of the receipts be used to lighten the responsibilities of the local municipalities or to lessen their taxation. For this reason it is desirable that the proceeds of the tax should be administered by some independent body, whose sole care is the interest of the pilgrims. Such local bodies already exist in the several Lodging House Fund Committees, and we recommend that the receipts from the tax be added to their funds and be administered by them, those for Deoghur and Jasidih Junction being pooled and given to the Deoghur Committee, and, similarly, those for Puri, Sakhigopal and Bhubaneswar, to the Puri Committee.

117. In Gaya, Puri and Deoghur what are known as Lodging House Funds

Lodging House Fund. **have been constituted under section 22 of the Lodging House Act which reads as**

follows:—"All fines and fees under this Act shall be expended in the sanitary improvement of all, or any, of the towns or places in which this Act may be in force, or in the sanitary improvement of pilgrim halting places or the roads leading to such towns or places, in such manner as the Lieutenant-Governor of Bengal may from time to time direct."

The fund is administered in each place by a Committee consisting of officials and non-officials. At Gaya and Puri the District Magistrate, as President, and the Civil Surgeon, as Health Officer, are the executive officers of the Funds; similar duties are discharged by the Sub-Divisional Officer and the Civil Assistant Surgeon at Deoghur. The other members of the Committees are appointed by nomination and consist of leading Hindu gentlemen who are in a position to advise on all subjects connected with the religious feelings, the comfort, and the convenience, of the pilgrims.

If our recommendation that the new Health Officers of Gaya, Puri and Deoghur should be made Health Officers under the Lodging House Act, is accepted, the Civil Surgeons at Gaya and Puri and the Civil Assistant Surgeon at Deoghur should be made *ex-officio* members of the respective committees.

The yearly income of each Fund varies with the number of pilgrims actually visiting, or expected to visit, the towns; but it is about Rs. 30,000 in Gaya, Rs. 32,000 in Puri and Rs. 4,000 in Deoghur. The main source of this income is from the fees for the licensing of lodging-houses: a certain amount is also obtained from fines inflicted for breaches of the bye-laws. The money is used to pay the establishment needed for the administration of the Act, and the surplus is available to supplement the resources of the local municipality in making sanitary arrangements for pilgrims at the various festivals, and to improve the general sanitation of the town. At Sakhigopal and Bhubaneswar practically the whole of the sanitation is paid for from the Puri Lodging House Fund.

The money available for expenditure, after payment of all charges for establishment and the maintenance of special equipment at the time of festivals, is considerable, and we are not satisfied that it has always been expended to the best advantage. As pointed out earlier in our report it is more important to provide permanent sanitary arrangements, which are sufficiently elastic to enable big influxes of pilgrims to be dealt with, than to make temporary arrangements to meet particular occasions. In the past, sums available from the Lodging House Funds have been largely utilised for the latter purpose and we found, both in Puri

and in Gaya, that money had been wasted on temporary expedients and unsuccessful experiments. The more recent policy adopted in Gaya, of allotting any surplus year by year to a comprehensive scheme which will effect a permanent sanitary improvement, is far more satisfactory and, to facilitate this being done, we would recommend that loans should be freely granted on the security of these Funds where approved works are undertaken.

The present method of administration of the Funds is, in our opinion, satisfactory. To allow them to be amalgamated with those of the local municipality, as has been suggested, would be unwise. If this were done, some reduction in taxation, favourable to local residents and unfavourable to the comfort and convenience of the pilgrims, would almost certainly result. The funds are contributed by the pilgrims and should, as at present, be devoted solely to their interests. Not only so, but we would recommend that, should any further sources of income directly connected with the pilgrim traffic become available, these also should be added to the Lodging House Fund.

118. In concluding our report we desire to record our acknowledgment of the assistance which we received from all, both **Conclusion.** officials and non-officials, to whom we applied for information during the course of our enquiry. We also wish to express our appreciation of the energy and zeal with which our shorthand clerk B. Mahesh Chand performed his numerous and arduous duties.



Appendices to the Report of the Pilgrim Committee, Bihar and Orissa.

- I. Government of India, Education Department, letter No. 1578-1588, dated the 24th August 1912, regarding the institution and scope of the Pilgrim Committee.
- II. Tour programme of the Committee in 1913.
- III. Statement showing monthly mortality from cholera in Puri town and district from 1892 to 1913.
- IV. Statement showing deaths from cholera in Gaya town and district from 1900 to 1913.
- V. Statement showing the total number of cases of cholera that occurred in different districts in Bengal during the 4 weeks from July 5th to August 2nd, 1902, and the number traced to pilgrims returning from Puri.
- VI. Statement showing the number of passengers found dead, or suffering, from cholera, plague and small-pox in trains or waiting sheds on the Bengal Nagpur Railway during 1912.
- VII. Map of Bengal Nagpur Railway showing distribution of cholera to different stations from Puri during July 1912.
- VIII. Plan showing details of pilgrim shelters.
- IX. Plan showing arrangement of pilgrim shelters.
- X. Plan showing alternative design for pilgrim shelters where the chief festival occurs during the rainy season.
- XI. Copy of Section 10 of Bengal Act IV of 1871 regarding power to inspect lodging houses.
- XII. Copy of Section 8 of Bengal Act IV of 1871 regarding fee payable on issue of certificate of Health Officer, and on grant of license.
- XIII. Statement showing deaths from all causes in Gaya town during the years 1902-1913.
- XIV. Building bye-laws in Puri and in Gaya.
- XV. Imaginary cross section of a road 12 feet broad.
- XVI. Table showing the total mortality caused by cholera and small-pox in Gaya, Puri and Deoghur towns from 1902 to 1913.
- XVII. Photo showing the huge crowds that gather round the wells to draw water even at an ordinary festival.
- XVIII. Details of conservancy staff and plant at Puri, Gaya and Deoghur.
- XIX. Tank at Gaya being filled with rubbish and earth in the wrong way and so as to cause the maximum amount of nuisance.
- XX. Method of dumping shown diagrammatically.
- XXI. Ballia type latrine.
- XXII. Fly-proof sweetmeat tray as used on Bombay, Baroda and Central India Railway.
- XXIII. Fly-proof sweetmeat tray on Great Indian Peninsula Railway.
- XXIV. Fly-proof sweetmeat shop counter on Great Indian Peninsula Railway.
- XXV. Photos showing fly-proof sweetmeat trays and counters as used on the Great Indian Peninsula Railway.
- XXVI. Fly-proof trolley.

XXVII. Vendors agreement for native refreshments, East Indian Railway.

XXVIII. Plan of pilgrim serai at Khargpur Junction.

XXIX. Plan showing situation of Booking office.

XXX. } Barriers at Booking office.

XXXI. }

XXXII. Pens for pilgrims.

XXXIII. Map of Bengal Nagpur Railway showing number of passengers found dead, or suffering, from cholera, plague and small-pox at different stations.

XXXIV. Map of Puri town.

XXXV. }

XXXVI. }

XXXVII. Statement showing deaths and ratios from all causes, Puri town, during the years 1902-13.

XXXVIII. Table showing number of lodging houses in Puri and Gaya.

XXXIX. Photos showing general arrangement of pilgrim shelters.

XL. Plan of area behind houses in Puri showing common arrangement of private latrines.

XLI. Photos of outfall drain, Puri.

XLII. Photos of Sacred Tanks—Puri.

XLIII. Sketch plan of Swetganga tank.

XLIV. Rough sketch of Narendra tank.

XLV. Photos of Markanda and Indradyumna tanks.

XLVI. Plan of temple at Puri.

XLVII. Statement showing the number of patients admitted into the Infectious Diseases Hospital, Puri, suffering from cholera during the years 1910-14, the number who were discharged, cured and the number who died.

XLVIII. Site plan of Puri Cholera Hospital.

XLIX. Statement showing calculated total number of attacks of cholera in Puri town for each month during the period, 1892-1913.

L. Site plan of proposed Cholera Hospital for Puri.

LI. Photos of two important thoroughfares in process of narrowing.

LII. Map of Gaya town.

LIII. }

LIV. }

LV. }

LV. (a) Plan of Ramsagar tank in Gaya.

LVI. Photo of Phalgu River, Gaya.

LVII. Statement of cases admitted into the Cholera Hospital, Gaya, 1910-14.

LVIII. Plan of Cholera Hospital compound at Gaya.

APPENDIX I.

Letter No. 1578-1588, dated Simla, the 24th August 1912.

From—The Secretary to the Government of India, Education Department.

To—The Secretary to the Government of Bihar and Orissa, Municipal Department.

The Government of India have had under their consideration the desirability of undertaking a comprehensive inquiry into the possibility of improving sanitary arrangements at centres where Hindu and Muhammadan pilgrims congregate for worship or for starting their journeys to Mecca, Kerbala or elsewhere. Improved facilities for travel have largely increased the number of pilgrims gathering at each centre, and also the distance from which they come. The risk of the importation and exportation of disease from these centres has consequently become greatly intensified and they form an ever present menace to the public health. The centres also re-act on one another and a merely local inquiry will not meet all the needs of the case.

2. Much has been done by local Governments to improve the sanitary arrangements at some of the larger fairs but a comprehensive inquiry would, the Government of India think, have useful results, while it would help in co-ordinating the sanitary arrangements at the different centres and in the reduction of mortality from disease such as cholera. It is desirable that the scope of the inquiry should be as wide as possible, including such questions as lodging house accommodation, sanitary arrangements on railways, and food and water-supplies. It is accordingly proposed to appoint a Committee consisting of the following:—

PRESIDENT.

Sanitary Commissioner with the Government of India.

MEMBERS.

The Sanitary Commissioner of the Province.

One member of the Indian Civil Service selected locally in each Province.

One unofficial Indian gentleman or other qualified person selected locally in each province.

A railway representative to be nominated from its staff, by each railway concerned in pilgrim traffic, who would serve for so long as the Committee remained on that particular line.

It is proposed that the inquiry should be commenced in September and be conducted in the course of the regular tours of the Sanitary Commissioner throughout the country. The term of deputation of the members will, it is proposed, be limited to the period of the enquiry in each province, and the President alone will be on the Committee throughout the enquiry. For each province the enquiry should not, save in exceptional cases, exceed one month, and in some provinces it will almost certainly be less. The Local Committee will report to the Local Government. At the conclusion of the several enquiries, the Sanitary Commissioner will draw up a report on the whole subject. It is possible that a grant from Imperial revenues may be necessary but no assurance on this point can be given at present.

3. I am to ask, that if His Honour the Lieutenant-Governor has no objection, the names of the members of the Committee who will be selected and deputed locally, may be communicated to the Government of India. The Sanitary Commissioner will then be instructed to draw up a programme of work and the various places to be visited in each province in communication with the Provincial Sanitary Commissioner and the local members of the Committee.

I am to request that the Government of India may be favoured with an early reply to this letter.

APPENDIX II.

Tour programme of the Pilgrim Committee in Bihar and Orissa in 1913:

PLACES.			DATES.
Puri	...	...	... July 4th to 7th.
Satyabadi	...	...	... " 8th.
Bhubaneswar	...	...	... " 9th.
Puri	...	...	... " 10th to 12th.
Khargpur	...	...	... " 13th.
Deoghur (Baidyanath)	...	...	... " 14th.
Gaya	...	...	... " 15th to 20th.



APPENDIX III.

Monthly mortality from cholera in Puri town (top line) and District (lower line) from 1892 to 1913.

Year.												
	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
1892 ...	5	17	22	20	35	147	39	1	0	65	122	2
	129	121	634	1,044	2,374	2,839	782	978	120	149	813	228
1893 ...	1	12	2	1	1	1	174	71	0	2	6	0
	42	91	91	57	10	22	250	589	93	85	89	73
1894 ...	1	5	10	3	1	0	101	8	0	56	45	1
	40	50	163	227	68	96	376	210	28	76	213	209
1895 ...	0	13	1	0	0	59	35	0	1	57	67	2
	66	30	25	13	8	56	347	187	101	388	630	245
1896 ...	18	53	31	0	2	1	104	4	3	1	0	3
	35	45	701	229	95	51	232	256	298	69	17	47
1897 ...	0	9	28	1	4	45	80	6	0	37	28	0
	55	40	300	404	857	3,002	2,088	1,123	417	197	205	81
1898 ...	0	11	9	0	0	0	0	0	0	0	0	0
	252	55	42	35	0	2	1	2	2	5	2	8
1899 ...	0	0	0	1	4	150	742	36	1	1	17	2
	0	7	13	116	125	386	1,492	782	132	61	43	85
1900 ...	1	3	36	87	1	33	63	12	0	10	13	6
	98	110	100	290	166	284	972	481	223	140	143	141
1901 ...	4	15	67	2	30	41	62	35	5	7	18	8
	64	152	1,301	1,901	1,778	881	1,177	754	373	251	145	232
1902 ...	10	16	16	7	8	336	376	6	2	3	3	0
	113	166	191	111	76	549	955	537	276	129	105	73
1903 ...	9	15	11	16	17	78	67	6	6	13	41	2
	7	154	516	577	1,788	1,386	1,067	304	12	18	170	142
1904 ...	0	4	1	0	0	0	1	0	0	1	8	11
	29	56	71	12	5	0	15	61	35	6	109	592
1905 ...	7	1	3	20	18	7	170	326	6	10	24	0
	397	381	231	203	310	197	239	590	382	215	120	136
1906 ...	13	36	20	1	1	19	33	32	9	7	27	5
	58	387	401	130	24	259	502	175	70	31	75	134
1907 ...	116	35	23	9	2	5	231	132	11	17	56	2
	270	873	608	369	219	273	959	2,301	1,313	530	316	427
1908 ...	4	23	48	10	19	136	24	3	2	7	3	3
	139	283	1,576	2,274	2,280	5,168	1,279	546	441	266	76	56
1909 ...	2	4	51	4	6	293	47	6	1	2	9	7
	1	10	423	439	137	323	348	48	8	2	6	151
1910 ...	41	10	10	2	0	1	49	43	9	16	10	2
	66	62	47	16	5	13	53	103	37	64	367	388
1911 ...	3	14	7	9	9	56	46	3	10	14	8	2
	159	211	203	1,044	1,005	607	167	79	83	135	43	1
1912 ...	10	10	59	9	21	26	373	618	10	4	2	1
	6	168	935	1,175	534	512	739	1,732	378	99	23	9
1913 ...	9	9	37	14	6	34	116	6	10	12	38	3
	5	66	94	186	135	64	514	407	137	40	38	86

APPENDIX IV.

Deaths from Cholera in Gaya Town (top line) and District (lower line) from 1900 to 1913.

Year.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
1900 ...	2	2	4	20	32	59	48	54	113	75	17	7
1901 ...	...	...	13	94	663	1908	5209	3042	528	303	184	23
1902 ...	2	10	11	6	2	3	14	207	112	44	16	10
1903 ...	...	10	15	6	7	10	164	1013	452	152	42	39
1904 ...	1	2	30	23	13	17	23	107	50	28	11	2
1905 ...	2	...	...	95	206	610	761	1268	280	242	30	3
1906 ...	2	...	4	9	6	10	133	46	6	24	54	7
1907 ...	7	5	8	7	4	4	8	34	15	52	13	4
1908 ...	3	1	1	1	13	43	24	18	40	47	61	8
1909 ...	5	7	4	4	9	4	4	365	418	73	29	1
1910 ...	...	1	2	3	3	8	238	2058	4668	4197	1311	247
1911 ...	25	14	1	2	5	5	40	43	57	5	33	1
1912 ...	10	17	11	866	1548	1582	2369	2356	784	186	126	13
1913 ...	262	29	14	1	...	3	53	214	311	141	51	17
1914 ...	38	25	11	12	1	249	631	1038	1239	568	122	106
1915 ...	1	20	15	22	11	64	141	105	49	14	9	1
1916 ...	15	2	7	234	2709	7035	7229	4035	423	62	12	1
1917 ...	1	3	45	21	23	16	19	12	9	10	9	...
1918 ...	2	1	42	554	351	144	128	119	32	6	29	1
1919 ...	1	3	49	20	11	3	69	79	101	53	3	4
1920 ...	...	...	..	32	57	410	4906	6173	1165	585	123	4
1921 ...	1	1	1	...	...	2	159	119	149	121	35	5
1922 ...	3	1	4	54	347	665	4985	4677	95	323	385	24
1923 ...	2	18	7	5	9	11	77	104	26	62	5	5
1924 ...	3	4	13	77	150	280	91	233	203	150	14	10
1925 ...	1	4	76	39	10	31	229	62	49	8	21	12
1926 ...	...	1	19	100	23	69	852	512	319	231	104	52

APPENDIX V.

Statement compiled by Major S. Anderson, I. M. S., from returns sent in by Civil Surgeons to show the total number of cases of cholera that occurred in different districts in Bengal during the 4 weeks from July 5th, to August 2nd, 1902, and the number which were traced to pilgrims returning from Puri.

Name of District.				Total number of cases of cholera	Number of cases actually traced to Puri pilgrims.
Puri	...	...	...	349	286
Cuttack	...	...	...	14	7
Balasore	...	...	...	20	10
Howrah	...	...	...	14	14
City of Calcutta	...	...	...	160	40
24 Pargannas	...	...	...	6	...
Hooghly	...	...	...	1	1
Khulna	...	...	...	4	...
Nadia	...	...	...	2	2
Midnapore	...	...	...	27	9
Murshidabad	...	...	...	6	...
Gaya	...	...	...	78	3
Faridpur	...	...	...	15	2
Backergunge	...	...	...	32	3
Tippera	...	...	...	13	6
Monghyr	...	...	...	11	...
Noakhali	...	...	...	2	1
Total				754	384
Bengal Nagpur Railway	...	...	...	163	163
Eastern Bengal State Railway	...	...	...	5	5
Total				168	168
Grand total				922	552

APPENDIX VI.

Statement showing the number of passengers found dead, or suffering from cholera, plague and small-pox in trains or waiting sheds on the Bengal Nagpur Railway during 1912.

Date.	Station at which found.	PASSENGER TRAVELLING.		NUMBER.		Disease.	Remarks.
		From	To	Living	Dead.		
January ...	3 Nainpur ...	Unknown ...		...	...	5	Plague
	6 " "	" "		...	...	1	"
	8 Rajnandgaon ...	" "		...	...	1	"
	11 Khargpur ...	Puri ...	Home	...	1	...	Cholera
	24 Nainpur ...	Jubbulpore ...		...	1	...	Plague
	25 " "	" "		...	...	1	"
	28 Khargpur ...	Puri ...	Home	...	1	...	Cholera
	... Nainpur ...	" "		...	...	1	Plague
February ...	3 " "	Seoni ...		...	2	...	"
	7 Jubbulpore ...	" "		...	...	1	"
	8 Katni ...	" "		...	...	1	Cholera
	9 " "	" "		...	...	1	"
	15 Chakardharpur ...	" "		...	...	1	"
	17 Nainpur ...	" "		...	...	1	Plague
	... " "	Seoni ...		...	...	1	"
	20 " "	Chindwara ...		...	3	...	Small-pox
	21 Khargpur ...	" "	Puri		1	...	Cholera
	22 Nainpur ...	" "		...	...	1	Small-pox
March ...	24 Katni ...	" "		...	...	1	Plague
	25 " "	" "		...	...	1	"
	29 Machada ...	" "		...	...	1	Cholera
	1 Puri ...	" "		...	1	...	"
	2 " "	" "		...	1	...	"
	... Padregang ...	" "		...	...	1	Plague
	3 Balasore ...	" "		...	...	1	Cholera
	4 Puri ...	" "		...	1	...	Cholera
	5 Khargpur ...	Jajpur ...	Calcutta ...	1	...	1	"
	8 Gondia ...	" "		...	2	...	Small-pox

Date.	Station at which found.	PASSENGER TRAVELLING		NUMBER.		Disease.	Remarks.
		From	To	Living	Dead.		
March	9 Gondia	...	...	1	...	Plague.	
	Bilaspur	Puri	...	2	...	Cholera.	
	"	"	...	1	...	Small-pox.	
	10 "	Raipur	...	...	1	Plague.	
	12 "	"	...	2	...	"	
	15 Bartala	...	...	...	1	"	
	16 Asansol	...	...	...	1	Cholera.	
	17 Bilaspur	Raipur	...	1	...	Plague.	
	21 Khargpur	Puri	Baidyanath...	1	...	Cholera.	
	23 Jhalda	Ranchi	...	...	1	"	
	25 Balasore	Howrah	...	...	1	"	
	26 Khargpur	Puri	Home	...	1	"	
April	31 Titpur	Itwari	...	3	...	Plague.	
	Chakardharpur	...	...	...	1	Cholera.	
	6 Khargpur	Howrah	...	...	1	"	
	10 Bilaspur	Raipur	...	1	...	Plague.	
May	11 Khargpur	...	...	...	1	"	
	19 Cuttack	...	...	1	...	Small-pox.	
	20 Bilaspur	Katni	...	2	...	"	
	22 Bhadrak	Howrah	...	...	1	Cholera.	
	5 Balasore	...	...	...	1	"	
	6 Katni	...	...	...	1	"	
	7 Naupada	...	...	...	1	"	
June	...	Khargpur	Puri	...	1	"	
	11 Raigarh	...	...	...	1	"	
	28 Durgargarh	Gondia	...	1	...	Small-pox.	
	1 Khargpur	...	...	...	1	Cholera.	
	6 Kburda Road...	...	...	1	...	"	
	10 Naupada	...	...	...	1	"	
	Khargpur	Berhampur	Assam	1	...	"	
July	11 Kburda Road...	...	...	...	1	"	
	20 Khargpur	Berhampur	Assam	2	...	"	
	24 "	Cheulkand	"	1	...	"	
	27 Khargpur	Berhampur	"	4	...	"	
	2 Adra	Puri	...	1	...	Cholera.	
	Khargpur	"	Home	1	...	"	
	"	Gaya	Puri	1	...	"	
	4 Bilaspur	Katni	...	1	...	Small pox.	
	7 Adra	Puri	...	2	...	Cholera.	
	8 Khargpur	Khargpur	Assam	1	...	"	
	"	Rewa	Puri	1	...	"	
	9 "	"	"	1	...	"	

Date.	Station at which found.	PASSENGER TRAVELLING		NUMBER.		Disease.	Remarks.
		From	To	Living	Dead.		
July	10	Adra	Puri	1	...	Cholera.	
		Khargpur	Rewa	1	...	"	
	"	Berhampur	Assam	1	...	"	
11	Bhadrak	...	...	...	2	"	
12	Adra	Puri	...	1	...	"	
	"	"	...	1	...	Small pox.	
13	Puri	...	...	1	...	Cholera.	
	Cuttack	...	...	1	...	"	
	Khargpur	Home	Puri	1	...	"	
15	Puri	...	...	1	...	"	
	Khargpur	Home	Puri	1	...	"	
16	Bhadrak	...	...	1	1	"	
	Adra	Puri	...	1	...	"	
	Khargpur	"	Home	1	...	"	
	"	...	Madras	1	...	"	
17	Bhadrak	...	...	3	...	"	
	Adra	Puri	...	1	...	"	
	Khargpur	"	Home	2	...	"	
	Adra	"	"	...	1	"	
18	Puri	Baidyanath	...	...	1	"	
	"	...	...	...	1	"	
	Baitarni Road	Baidyanath	...	...	1	"	
	Khurda Road	...	...	1	1	"	
	Bhubaneswar	Bara Bhum	Bhubaneswar	1	...	"	
	Cuttack	...	...	1	...	"	
	Bhadrak	...	...	1	...	"	
	Baitarni Road	...	...	2	...	"	
	Adra	Puri	...	1	...	"	
18	Adra	Baidyanath	Puri	1	...	"	
	Bhojudih	Puri	Gaya	1	...	"	
	Chakardharpur	"	"	1	...	"	
	Khargpur	"	...	12	...	"	
	"	"	Calcutta	1	...	"	
19	Khurda Road	...	...	1	1	"	
	Bhadrak	...	...	4	...	"	
	Bhadrak	Baidyanath	Puri	1	...	"	
	Cuttack	...	...	1	...	"	
	Bhubaneswar	Monghyr	Bhubaneswar	1	...	"	
	Bilaspur	Agra	...	1	...	"	
	Khargpur	Puri	Home	8	...	"	
	Bhubaneswar	"	...	...	1	"	
	Asanboni	...	...	...	1	"	

Date.	Station at which found.	PASSENGER TRAVELLING		NUMBER.		Disease.	Remarks.
		From	To	Living.	Dead.		
July 19	Adra	...	...	...	2	Cholera.	
	Bhojudih	...	...	...	1	"	
	Bilaspur	...	Agra	...	1	"	
20	Gajudih	...	...	...	1	"	
	Sakhigopal	...	Sakhigopal	...	3	"	
	Khurda Road	...	...	2	1	"	
	Bankura	...	Sakhigopal...	...	1	"	
	Machada	...	Puri	...	1	"	
	Santragachi	...	...	...	1	"	
	Cuttack	...	...	2	...	"	
	Bhadrak	...	...	8	...	"	
	Bhubaneswar	...	Gwalior	Bhubaneswar	1	"	
	Adra	...	Puri	Baidyanath...	1	"	
	Bankura	...	...	1	...	"	
	Bilaspur	...	...	2	...	"	
	Khargpur	...	...	Home	7	"	
21	Bhadrak	...	...	1	1	"	
	Khurda Road	...	...	1	...	"	
	Balasore	...	...	1	2	"	
	Barang	...	Barang	Howrah	1	"	
	Baitarni Road	...	...	1	...	"	
	Adsa	...	Bhubaneswar	...	2	...	"
	"	...	Puri	Gaya	1	...	"
	Bhojudih	...	...	1	...	"	
	Salboni	...	...	1	...	"	
	Bilaspur	...	...	2	...	"	
	Khargpur	...	...	9	...	"	
	"	...	Khargpur	...	1	...	"
	Baitarni Road	...	Sakhigopal	...	1	...	"
	Bhubaneswar	...	...	...	2	"	
	Saiboni	...	...	...	1	"	
	Katni	...	...	...	1	"	
	Kenduapada	...	Sakhigopal ...	...	1	"	
	Balasore	...	Puri	...	1	"	
	Adra	...	...	1	0	"	
22	Chakardharpur	...	Sakhigopal...	...	1	"	
	Umaria	...	...	1	1	"	
	Bhubaneswar	...	...	1	1	"	
	Raipur	...	Nagpur	...	1	"	
	Bankura	...	Sakhigopal...	...	1	"	
	Bilaspur	...	...	...	1	"	
	Cuttack	...	...	4	...	"	

Date.	Station at which found.	PASSENGER TRAVELLING		NUMBER.		Disease.	Remarks.
		From	To	Living	Dead.		
July	22	Adra	Puri	2	...	Cholera.	
		Bilaspur	...	4	...	"	
		Bankura	...	1	...	"	
		Chakardharpur	...	1	...	"	
		Jharsuguda	...	2	...	"	
		Umaria	...	1	...	"	
		Sahdol	...	1	...	"	
		Khargpur	Home	14	...	"	
		"	Calcutta	1	...	"	
	23	Baitarni Road	...	2	2	"	
		Cuttack	...	1	...	"	
		Adra	Puri	3	...	"	
		Bankura	...	1	...	"	
		Jharsuguda	Puri	4	...	"	
		Raipur	Nagpur	1	...	"	
		Raigarh	Puri	1	...	"	
		Bilaspur	...	9	...	"	
		Khargpur	Home	9	...	"	
		Katni	...	3	1	"	
		Jharsuguda	...	...	2	"	
		Kargi Road	...	...	1	"	
		Santragachi	Bhubaneswar	...	1	"	
		"	Sakhigopal	...	1	"	
		Chakardharpur	Puri	2	1	"	
		Jharsuguda	Khargpur	...	1	"	
		Chakardharpur	"	...	1	"	
		Katni	...	...	1	"	
		Cuttack	...	2	1	"	
		Bhubaneswar	...	1	1	"	
		Khurda Road	...	3	3	"	
		Bilaspur	...	...	2	"	
		Khargpur	...	...	1	"	
		Umaria	Puri	...	1	"	
		Itwari	Khargpur	...	1	"	
		Baitarni Road	...	...	1	"	
		Bhadrak	...	3	2	"	
		Sahdol	Puri	3	...	"	
		Jubbulpore	...	1	...	"	
		Itwari	...	1	...	"	
		Bilaspur	...	4	...	"	
		Garbeta	...	1	...	"	
		Khargpur	Home	8	...	"	

Date.	Station at which found.	PASSENGER TRAVELLING		NUMBER.		Disease.	Remarks.
		From	To	Living	Dead.		
July 1	25 Bhubaneswar ...	...	...	1	1	Cholera.	
	Adra ...	Puri	...	2	...	"	
	Jharsuguda ...	"	...	2	...	"	
	Bilaspur ...	"	...	4	...	"	
	Khargpur ...	"	...	11	...	"	
	Katni ...	...	...	...	1	"	
	Sakhigopal ...	...	...	...	2	"	
	Bilaspur ...	...	...	...	1	"	
	Balasore ...	Puri	...	...	1	"	
	Adra ...	...	...	...	1	"	
26	Balasore ...	...	...	2	1	"	
	Bilaspur ...	Puri	...	5	...	"	
	" "	...	...	1	...	Small-pox	
	Adra ...	"	...	2	...	Cholera.	
	Jharsuguda ...	"	...	1	...	"	
	Khargpur ...	"	Home	8	...	"	
27	" Allahabad ...	Allahabad	Puri	2	...	"	
	Bhubaneswar ...	...	...	2	1	"	
	Khargpur ...	Puri	Home	6	...	"	
	Ehadak ...	...	...	...	1	"	
28	Adra ...	Bhubaneswar	...	...	1	"	
	" "	...	...	...	1	"	
	Khargpur ...	Puri	Home	7	...	"	
	" Paidyanath ...	Paidyanath	Rameswar	1	...	"	
29	" Cuttack ...	Cuttack	Calcutta	1	...	"	
	Bilaspur ...	Puri	...	2	...	"	
	Khargpur ...	"	Home	2	...	"	
	Jharsuguda ...	"	...	...	1	"	
	Baitarni R.d. ...	...	...	...	1	"	
	Bhubaneswar ...	...	...	...	1	"	
30	Adra ...	Puri	...	1	1	"	
	" "	...	...	1	...	Small-pox.	
	" "	...	...	1	...	Cholera.	
	Khargpur ...	"	...	...	1	"	
August	1 Bilaspur ...	Puri	...	...	1	"	
	Panchkura ...	...	...	...	1	"	
	Sakhigopal ...	...	...	...	1	"	
	2 Bilaspur ...	...	...	...	2	"	
	3 Khargpur ...	Puri	Home	1	...	"	
	Bilaspur ...	"	...	1	...	"	

Date.	Station at which found.	PASSENGER TRAVELLING		NUMBER.		Disease.	Remarks.
		From	To	Living	Dead.		
August ...	6 Khargpur ...	Puri ...	Home ...	1	...	Cholera.	
	Cuttack ...	...	"	1	...		"
	7 Khargpur ...	Puri ...	Home ...	1	...		"
	" ...	Home ...	Puri ...	2	...		"
	8 " ...	Puri ...	Home ...	3	...		"
	Bilaspur ...	" ...	"	1	...		"
	9 Khargpur ...	" ...	Calcutta ...	1	...		"
	" ...	" ...	Home ...	1	...		"
	Bilaspur ...	" ...	"	3	...		"
	Jharsuguda ...	" ...	"	2	...		"
	Puri ...	" ...	"	1	...		"
	10 Jharsuguda ...	" ...	"	...	1		"
	12 Khargpur ...	Puri ...	Home ...	1	...		"
	" ...	Calcutta ...	"	1	...		"
	13 Jharsuguda ...	Sakhigopal ...	Gaya ...	1	...		"
	14 Khurda ...	" ...	"	...	1		"
	Adra ...	Sakhigopal ...	"	...	1		"
September...	16 Khargpur ...	Puri ...	"	1	...	Cholera.	
	18 Ummer ...	Arjani ...	"	1	...		"
	20 Khargpur ...	Puri ...	"	1	...		"
	21 Khurda road ...	" ...	"	1	...		"
	23 " ...	" ...	"	...	1		"
	3 Tharsa ...	" ...	"	...	1		"
	23 Bankura ...	Puri ...	"	...	1		"
	29 Howrah ...	" ...	"	...	1		"
October ...	17 Khargpur ...	Cuttack ...	Khargpur ...	1	...		"
	4 Chakradharpur ...	" ...	"	...	1		"
November...	20 Khargpur ...	Home ...	Baidyanath ...	1	...		"
	21 " ...	Puri ...	Home ...	1	...		"
	25 Asansol ...	" ...	"	...	1		"
	29 Khargpur ...	Berhampur ...	Assam ...	1	...		"
December...	31 " ...	Khargpur ...	Midnapore ...	1	...	Small-pox.	

54 cases of cholera removed from the Railway Station at Puri during Ju'y 1912 are not shown in the tables.

APPENDIX XI.

Copy of Section 10 of Bengal Act IV of 1871.

It shall be lawful for the Magistrate or the Health Officer, or for any other person whom the Magistrate shall by any writing thereunto authorize, at any time to

enter into any lodging-house, and to inspect and examine the same and every part thereof, not being in the exclusive use and occupation of women, who, according to the custom and manners of the country, ought not to be compelled to appear in public; provided always that if, in the judgment of the Magistrate such reason shall exist as to necessitate an entry into and inspection and examination of such apartments so exclusively used and occupied by such women as aforesaid, it shall be lawful for the Magistrate, upon reasonable notice of such his intention being affixed to the house in which such women are residing, to enter into and inspect and examine, or to authorize under his hand any other person to enter into and inspect and examine, such apartments of such women as aforesaid. Provided, further, that no entry, inspection or examination, shall be made between the hours of 9 P.M. and 6 A.M. except by—

- (a) the Magistrate himself or
- (b) the health officer, if he is also the Civil Medical Officer of the district, or
- (c) an officer, not below the rank of Sub-Deputy Magistrate or Sub-Deputy Collector who is authorised in writing in this behalf by the Magistrate.



APPENDIX XII.

Copy of Section 8 of Bengal Act IV of 1871.

There shall be charged upon every certificate of the Health Officer, issued Fee payable on issue of certificate of Health upon an application therefor by the owner Officer, and on grant of license. of any house, a fee of one rupee; and upon every license a fee shall be payable, calculated upon the entire number of lodgers which is mentioned on the certificate at such rate, not exceeding one rupee for each lodger, as the Lieutenant-Governor may by notification direct.



Appendix XIII.

Statement showing deaths from all causes for Gaya town during the years 1902-1913.

Year.	Population.	ACTUALS.		RATIO PER 1,000.						REMARKS.									
		Cholera.	Small-pox.	Plague.	Fever.	Dysentery and Diarrhoea.	Respiratory Diseases.	All other causes.	Total deaths from all causes.										
1902	71,288	307	44	...	1,620	336	...	59	818	3,184	4.30	61	2272	4.71	...	82	11.47	44.6	
1903	71,288	301	40	749	1,978	338	...	83	913	4,402	4.23	56	15.01	27.74	4.74	...	116	12.80	61.74
1904	71,288	161	66	2,134	2,483	327	...	63	853	6,992	2.25	92	29.93	34.83	4.58	...	95	11.96	85.45
1905	71,288	923	6	1,215	2,286	524	163	50	1,000	6,267	12.94	68	17.04	32.06	7.35	2.28	126	14.86	87.91
1906	71,288	231	24	1,282	2,294	377	83	57	624	4,972	3.24	33	17.98	32.17	5.28	1.16	79	8.75	69.74
1907	71,416	1,096	89	1,633	1,869	365	69	71	629	5,821	15.34	1.24	22.56	26.17	5.11	96	99	8.80	81.50
1908	71,416	452	641	2	1,971	270	72	66	649	4,123	6.32	897	1.02	27.59	3.78	1.00	92	9.08	57.73
1909	71,416	168	42	...	1,828	289	82	81	649	3,139	2.35	58	...	25.59	4.04	1.14	113	9.08	43.95
1910	71,416	396	19	47	1,860	520	77	76	950	3,745	5.54	26	65	26.04	4.48	1.07	106	13.30	52.44
1911	71,400	593	...	998	1,778	473	106	73	839	4,860	8.31	...	13.98	24.50	6.62	1.48	102	11.75	66.07
1912	71,400	331	13	1,322	1,369	357	50	108	847	3,207	4.64	18	21.13	18.33	5.00	1.26	151	11.86	44.92
1913	71,400	542	5	516	1,362	1,339	349	82	69	955	5.91	759	70	19.63	4.89	1.15	125	13.38	54.50

Appendix XIV.

BUILDING BYE-LAWS IN PURI AND IN GAYA.

(a) Puri Municipality.

Notification No. 1694-M. of 19th December 1911.

In exercise of the power conferred by clause (2) of section 241 of the Bengal Municipal Act, 1884 (Bengal Act III of 1884) the Lieutenant-Governor

Puri. in Council is pleased to sanction the following rules which have been framed by the Commissioners of the Puri Municipality, under clause (1) of that section and clause (2) of section 237 of the Act.

Rules made under sections 237 (2) and 241 of the Bengal Municipal Act, 1884, for the Puri Municipality.

1. The following rules apply to houses not being huts. Huts, as such, are governed by sections 243 and 244 of the Bengal Municipal Act.

2. Any powers of the Chairman under these rules can be delegated by him to the Vice-Chairman.

3. Conditions as to use of house sites. No piece of land shall be used as a site for the erection of a public building or a dwelling house, unless the site is certified by the overseer to be dry and well drained or to be capable of being dried or well drained, in which latter case instructions should be furnished to the applicant as to what improvements are necessary before a certificate can be granted. It rests with the Chairman to decide in each case whether any certificate is necessary at all.

4. Height. (1) If a house is situated at the side of a road, no portion of the house shall be higher than thrice the distance of its base to the opposite side of the street. The height should be calculated from its plinth and not from its base.

Explanation. If a house be placed at the edge of the road, its height must not exceed thrice the width of the street, but if the house or one or more of the storeys be set back, the height of the house may be increased thrice as much as the basement of the portion set back is distant from the adjoining edge of the road.

(2) Notwithstanding anything contained in sub-rule (1) the Commissioners at a meeting may give permission for building houses on the side of any road or lane after considering the particular circumstances of each case.

(3) If a house is situated on a corner plot the height of the house shall not exceed thrice the average width of the two streets.

(4) Level of floor. The level of the ground or lowest floor of every house erected or re-erected from the ground-level shall not be less than two feet above the nearest road.

(5) Projections. No part of any house shall project over or under any road except as provided in rules 7 and 8.

(6) Entrance culvert. The applications which are filed for entrance culverts must contain the following particulars :

(1) Length. (2) Breadth beyond drain. (3) Ventage allowed.

(a) Ordinarily the following dimensions will be allowed for foot traffic :—

(1) Three feet. (2) Ten inches. (3) Same size as area of the drain up to a maximum of three square feet.

The number of entrance culverts in any building shall not exceed the number of separate shops or dwelling houses. The intervening space between culverts over a drain shall not be covered over by planks, stone slabs or in any other manner.

(b) For wheel traffic, the size and nature of the entrance culverts are left to the discretion of the Chairman.

7. **Balcony.** No balcony or verandah shall be erected in any road which is less than 30 feet in width, and every balcony or verandah must be supported to the satisfaction of the Chairman.

8. **Distance between building line and street alignment.** In any road laid out after these rules come into force in which continuous building is allowed, the distance between the building line and the street alignment shall not be less than 4 feet. "Building line" means a line (in rear of the street alignment) up to which the main wall of a building abutting on a street may lawfully extend.

9. **Outer walls.** The outer walls of a masonry house must be constructed of burnt brick or some other hard and incumbustible substance.

10. **Portion of the site of a dwelling house which may be built upon.** The total area covered by all the houses (including verandah) erected or re-erected on any site used for a dwelling house shall not exceed three-fourths of the total area of the site, but in the case of re-building, this rule will not apply in a case in which the site is less than 500 square feet. Provided that this rule does not apply in cases in which there is already a public road or a square to the rear of the house.

11. The minimum superficial area of every interior open courtyard in a building shall be one-fourth of the total area of the building round the yard and the yard together.

12. The minimum width of every such open courtyard shall be 8 feet.

13. If either side of a building is not attached to the adjacent building (*i.e.*, where there is open space, however small, between the walls of the two adjacent buildings), there must be between the two buildings an open space extending along the entire length of such side and belonging exclusively to the said building.

14. The minimum width of such open space from every part of the said building to the boundary line (or if the boundary is wall) the inner edge of the boundary wall of the land or building opposite such part shall be (a) $4\frac{1}{2}$ feet, if there is a building next to such boundary line or wall.

(b) 3 feet, if there is an open space of not less than 4 feet on the other side of such boundary line or wall.

NOTE.—In no case shall the open side space be less than 4 feet exclusive of boundary walls.

15. No privy shall be placed under any room other than a bathroom or privy.

16. There must ordinarily be, in the absence of any specific permission of the Chairman to the contrary, in the rear of every dwelling house, an open space extending along the entire width of the house of not less than 10 feet.

17. Every interior courtyard must be raised at least 6 inches above the level of the centre of the nearest street or road so as to admit of easy drainage into the street.

18. The height of the rooms on the basement floor shall not be less than 9 feet.

19. Water-spouts should be so arranged as to discharge water in a Municipal drain or on land belonging to the proprietor of the house to which the water-spout is attached.

20. **Application for the erection or re-erection of a house.** Every notice under section 237 of the Bengal Municipal Act for the erection or re-erection of a house must be made in writing on a printed form (to be supplied free of charge by the Chairman) and must contain the following information :—

(a) The position of the site.

(b) The circle and the number of the site assigned to it in the assessment book.

- (c) A plan of the site drawn to a scale of not less than 50 feet to an inch showing its boundaries, position in relation to neighbouring roads and the position on the site of the proposed building.
- (d) Drawings on a scale of not less than 8 feet to an inch showing a ground plan, two sections and elevation of the proposed building. On this drawing must also be shown all proposed drains, privies and cesspools.
- (e) Purpose for which the building is intended.
- (f) The notice and all drawings and plans must be signed by the applicant.

21. The Chairman shall sign all passed plans in token of his approval.

22. If the proposed house is not to be of burnt brick or stone it shall not comprise more than two storeys, nor shall it exceed 18 feet in height measured from the top of the plinth to the junction of the eaves and wall.

(b) Gaya Municipality.

Notification No. 141-M. of the 22nd January 1912.

In exercise of the power conferred by clause (2) of section 241 of the Bengal Municipal Act, 1884 (Bengal Act III of 1884), the Lieutenant-Governor in Council is pleased to sanction the following rules which have been framed by the Commissioners of the Gaya Municipality, under clause (1) of that section and clause (2) of section 237 of the Act. The rules apply to building erected or re-erected within Wards 1 to 9 of the Municipality.

Rules made under section 237 (2) and 241 of the Bengal Municipal Act, 1884, for Wards 1 to 9 of the Gaya Municipality.

1. In erecting or re-erecting buildings the following rules shall be adhered to:—

(a) The external walls of any such buildings as aforesaid shall be constructed of masonry, clay, sunburnt bricks or stones, and in no case shall an external wall abutting on a public road, street, lane or drain be less than two feet from such public road, street, lane or drain.

EXPLANATION.—No pucca platform, except steps, shall be allowed over the two feet of land thus left.

(b) The party walls be constructed of masonry, clay, iron, wood, stone or lath and plaster.

(c) The privy shall not be built within ten feet from the road without the special sanction of the Commissioners.

(d) The drain of the house shall have a proper slope towards the public drains.

(e) No balcony or eaves shall project over any public drain, road, street, lane or thoroughfare, but may project over the two feet of space left under these rules, provided there are no external supports on this space.

(f) The privy shall be constructed on a plan approved by the Commissioners at a meeting having due regard to the convenience of the neighbour, and shall afford proper facilities for cleansing. The door for the egress and ingress of mehtars shall not be less than five feet in height.

(g) The water of any upper storey shall be carried down to the drain by means of down-pipes extending to the road or the drain or by other suitable contrivance. Spouts or openings without such down-pipes shall not be allowed.

2. (1) Every notice for the erection or re-erection of a house not being a hut required by section 237 of the Municipal Act shall be accompanied by a site plan of the land drawn to a scale of not less than 50 feet to an inch and shall show:—

- (a) the position of the building and appurtenant out-buildings to be erected on the land with reference to adjoining public roads and drains, and if no public road adjoins the premises, then to the nearest public road and drains and other requirements under rule 1 of these rules;
- (b) the area to be occupied by the building and out-buildings on the land;
- (c) the names (if any) or description of the adjacent roads, streets, streams, bridges, culverts or building; and
- (d) the number of the ward and the name or number of the mahalla and street or road in which the land is situated.

Provided that if the applicant satisfies the Commissioners that the building will be less than Rs. 250 in value, the site plan need not be to scale, but must be dimensioned in figures to show to the satisfaction of the Commissioners the size of the building and its position on the land, together with the position on the land with reference to the adjacent building or lands.

(2) Every such person giving notice as required by law in respect of a masonry building shall submit with such notice plans, sections and elevations drawn to a scale of not less than eight feet to an inch, showing the levels at which the foundation and the lowest floor or plinth are proposed to be laid with reference to the crown level of the adjacent roads or streets, the position of the line or frontage of the proposed building and level of the site on which the house is to be built. This shall be submitted in triplicate.

Provided that if the applicant satisfies the Commissioners that the building will be less than Rs. 250 in value, it shall be sufficient to show in writing to the satisfaction of the Commissioners the levels at which the foundation and the lowest floor are proposed to be laid.

(3) Every such person shall, when required by the Commissioners, submit with such notice as aforesaid specifications of the work intended to be constructed and the materials to be used for the foundations, floor walls and roofs respectively.

APPENDIX XVI.

Table showing the total mortality caused by Cholera and Small-pox in Gaya, Puri and Deogurh towns from 1902 to 1913.

Year.	GAYA.			PURI.			DEOGURH.		
	DEATHS FROM		Population.	DEATHS FROM		Population.	DEATHS FROM		Population.
	Cholera.	Small-pox.		Actuals.	Ratio per mille.		Cholera.	Small-pox.	
1902	44	1.07	71,283	4.30	44	32,000	483	15.09	3
1903	44	1.07	71,283	3.01	4.22	32,000	281	8.78	4
1904	44	1.07	71,236	1.61	2.25	32,000	26	8.81	1.12
1905	44	1.07	71,288	9.23	12.94	32,000	592	18.50	6
1906	44	1.07	71,288	231	3.24	32,000	203	6.34	41
1907	44	1.07	71,416	1,096	15.34	32,000	639	19.97	24
1908	44	1.07	71,416	452	6.32	32,000	282	8.81	75
1909	44	1.07	71,416	1,68	2.35	32,000	432	13.50	16
1910	44	1.07	71,416	396	5.54	193	6.03	7	22
1911	44	1.07	71,400	593	8.31	35,000	181	5.17	3
1912	44	1.07	71,400	331	4.64	13	18	32.66	...
1913	44	1.07	71,400	544	7.59	5	0.07	35,000	23
									6.58
									75
									11,594
									4
									35

Details of conservancy staff and plant at Puri, Gaya and Deoghar.

CONSERVANCY STAFF

CONSERVANCY PLANT.

גנדי

APPENDIX XXVII.

(TO BE STAMPED BEFORE EXECUTION, WITH AN EIGHT ANNA STAMP.)

EAST INDIAN RAILWAY.

Vendor's agreement for Native Refreshment including milk, betel and fruit, etc.

I,..... Badge No..... in consideration of my being allowed to vend* at..... station do hereby bind myself to the East Indian Railway Company under the following conditions :—

1. To deposit with the Railway Company as security a sum of Rs.†..... for the right of vending the articles detailed above.
2. To pay in advance on the first day of each month a sum of Rs. on account of‡.....
3. To sell and always have on hand good and fresh articles and wares at the current rates of the local bazar, and give full weight.
4. The refreshments offered for sale shall be subject daily at all times to the inspection of any duly authorised officer of the Railway Company who shall have the right to reject and prohibit the sale of unwholesome or objectionable articles and to order their removal from the premises and to order other approved refreshments to be brought in place of them.
5. That myself and assistants when employed in the sale of the articles specified in this agreement shall be clearly dressed in uniform and wear the badges required by the Railway Company.
6. To pay for all badges and uniforms supplied by the Railway Company.
7. To be subject in all matters to the orders of the Railway Company.
8. Not to sublet the privilege of vending the above-mentioned commodities to any other person.
9. That the number of assistants employed by me in vending on the Railway Company's premises shall be limited to any number which the Railway authorities may affix.
10. To pay at the sole discretion of the Railway Company a fine not exceeding a sum of Rs. 10 for each substantiated complaint in regard to bad or stale articles of food, short weight, breach of tariff rates, subletting of contract and absence of salesmen.
11. To forfeit at the discretion of the Railway Company my privilege of selling, and any amount or part of any amount I have paid as a deposit for the privilege of vending.
12. To give up my badge or badges when required to do so on their value being refunded to me.
13. I further agree that the Railway Company shall reserve the right of dispensing with my services as a vendor at any time they may consider it advisable to do so without assigning any reason to me for their action.

Dated

..... 19

Signature.....

Witness

..... Name

..... Occupation.

*Here enter the articles allowed to be sold and also if the privilege is for the platform, the station yard, or for both.

† Amounts to be entered in words.

‡ Here enter "vending fees" or "rent of stall."

From

District Traffic Superintendent.

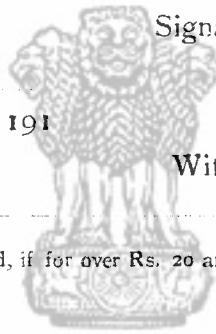
To

Chief Auditor,
Calcutta.Vendor badge No. whose agreement is
overleaf has ceased to vend at station on and fromWill you please refund him through the Station Master station
the sum of Rs. his deposit with the East Indian Railway Company ?

Dated 191 District Traffic Superintendent.

Received from the East Indian Railway the sum of Rs. being my
deposit with the said Company on account of vending
at station.

Signature Stamp.



Witness

(N.B.—This receipt must be stamped, if for over Rs. 20 and must be witnessed by the Station Master personally.)

संस्कृत नियन्त्रण

APPENDIX XXXVII.

Statement showing deaths and ratios (per 1,000 of population) from all causes for Puri town during the years 1902-1913.

Year.	Population.	ACTUALS.										ACTUALS.									
		Ratio per 1,000.					Ratio per 1,000.					Ratio per 1,000.					Ratio per 1,000.				
All other causes.		Respiratory Diseases.		Diseases.		All other causes.		Respiratory Diseases.		Diseases.		All other causes.		Respiratory Diseases.		Diseases.		All other causes.		Respiratory Diseases.	
		Cholera.	Small-Pox.	Fever.	Plague.	Cholera.	Small-Pox.	Fever.	Plague.	Cholera.	Small-Pox.	Fever.	Plague.	Cholera.	Small-Pox.	Fever.	Plague.	Cholera.	Small-Pox.	Fever.	Plague.
1902	32,000*	483	3	...	530	264	22	24	509	1,835	1,509	100	...	...	1656	825	69	75	1591	5734	1591
1903	32,000	281	4	...	839	224	16	25	492	1,881	878	12	...	...	2622	700	50	78	1537	5878	1537
1904	32,000	26	10	...	461	200	24	17	336	1,074	81	31	...	...	1441	625	75	53	1050	3356	1050
1905	32,000	592	6	...	408	260	27	20	392	1,705	1,850	119	...	...	1275	812	84	62	1225	5328	1225
1906	32,000	203	41	...	318	214	11	25	462	1,274	634	28	...	...	994	669	34	78	1444	3981	1444
1907	32,000	639	24	...	537	183	24	19	602	2,028	1,997	75	...	...	1678	572	75	59	1881	6337	1881
1908	32,000	282	64	...	614	267	54	17	679	1,977	881	200	...	...	1919	834	169	53	2122	6178	2122
1909	32,000	432	16	...	530	206	71	21	413	1,689	1350	50	...	...	1656	644	222	66	1291	5278	1291
1910	32,000	193	7	...	603	316	59	14	460	1,652	603	22	...	...	1884	988	184	44	1437	5162	1437
1911	35,000*	181	3	...	537	237	74	12	445	2,489	517	60	...	...	1534	677	211	34	1271	4254	1271
1912	35,000	1,143	...	...	726	337	94	12	586	2,898	3266	...	...	...	2074	963	269	34	1674	8280	1674
	35,000	294	23	...	432	189	82	21	341	1,382	840	66	...	...	1234	540	234	60	974	3949	974

*The populations
are the approxi-
mate permanent
resident populations.

APPENDIX XXXVIII.

LODGING HOUSES.

In Puri.

Year.			Number of lodging houses licensed.	Total accommoda- tion for which licensed.
1909-10	...	...	1,316	32,889
1910-11	...	...	570	21,783
1911-12	...	...	462	15,130
1912-13	...	...	1,769	53,569
1913-14	...	...	644	27,897
Total			4,611	1,51,268
Average for 5 years	...	...	922	30,254

B. In Gaya.

1910-11	...	...	561	30,067
1911-12	...	...	520	26,648
1912-13	...	...	560	24,847
Total			1,641	81,562
Average for 3 years	...	...	547	27,187

APPENDIX XLVII.

Statement showing the number of patients admitted into the infectious diseases hospital, Puri, suffering from Cholera during the years 1910-14, the number who were discharged, cured, and the number who died.

Month.	1910.			1911.			1912.			1913.			1914.		
	Admitted	Cured.	Died.	Admitted	Cured.	Died.	Admitted	Cured	Died.	Admitted	Cured.	Died.	Admitted	Cured.	Died.
January	31	13	15	7	3	3	11	6	3	9	3	4	4	2	2
February	4	3	4	8	5	3	8	5	3	5	3	3	19	11	7
March	13	4	6	5	1	4	27	14	1	46	16	22	39	16	21
April	1	3	1	4	2	1	3	5	2	11	11	2	8	7	3
May	0	0	0	8	5	1	11	3	4	9	13	1	11	6	4
June	3	1	2	38	18	16	16	13	4	34	10	12	20	6	7
July	58	25	31	28	21	13	447	194	202	123	75	60	8	9	6
August	18	5	9	3	1	1	155	102	101	8	7	2	4	3	1
September	6	5	1	8	1	0	3	4	1	8	3	1	9	7	2
October	14	7	7	22	18	7	5	4	1	8	9	4	6	5	8
November	11	8	5	6	6	5	1	2	0	37	18	17	1	3	0
December	3	2	1	0	0	0	1	0	1	1	2	1	2	1	0
Total	162	76	82	137	81	54	688	352	323	299	170	129	131	76	54
Percentage of recoveries	46.9			59.1			51.2			56.9			58.0		
Total deaths from Cholera in Puri.	193			181			1,143			294			150		
Percentage of total Cholera deaths which occurred	57.5			70.2			71.7			56.2			64.0		

APPENDIX XLIX.

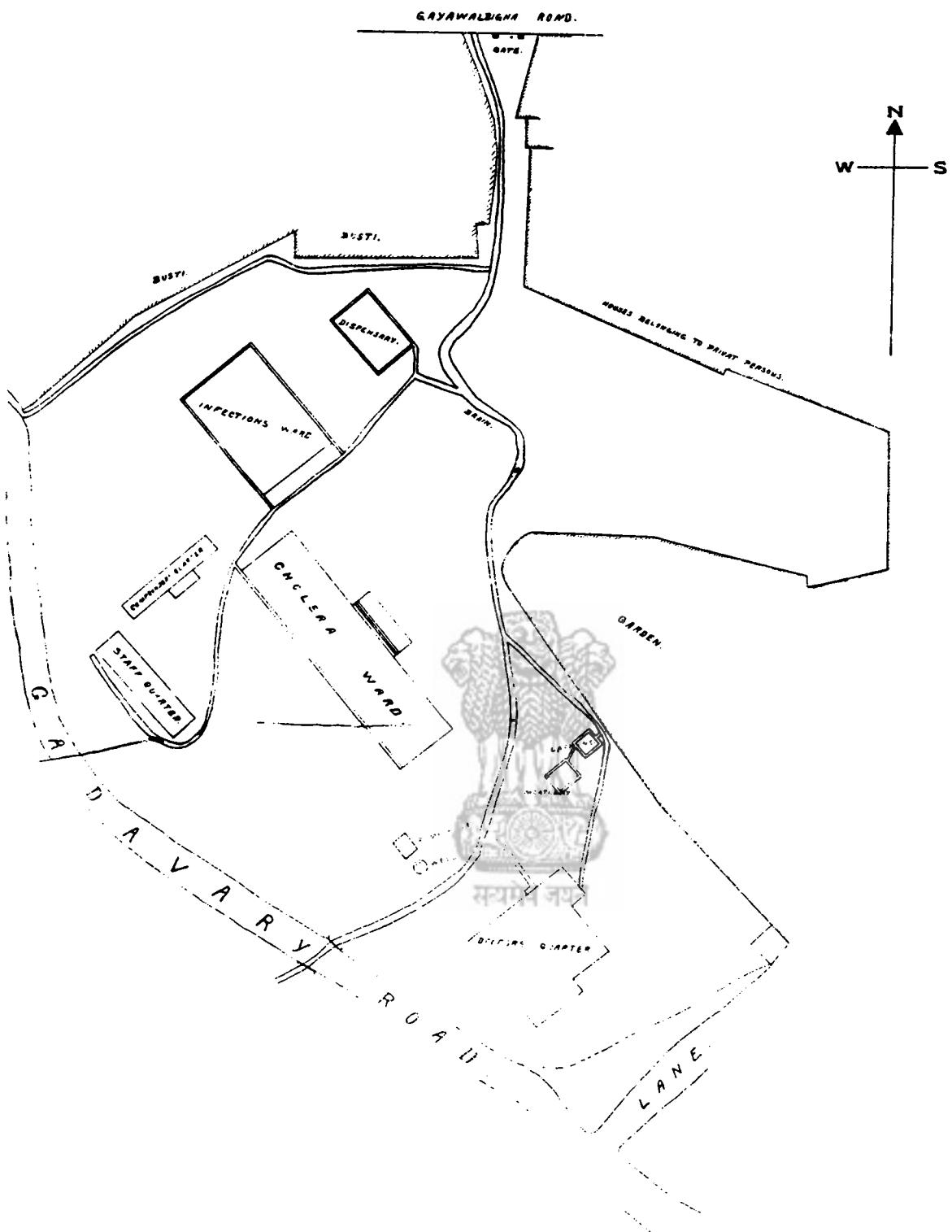
Calculated total number of attacks of Cholera in Puri town for each month during the period 1892-1913.

Year.			January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
1892	...	...	7	25	53	30	52	220	58	1	0	97	183	3
1893	...	...	1	18	3	1	1	1	261	106	0	3	9	0
1894	...	...	1	7	15	4	1	0	151	12	0	84	67	1
1895	...	...	0	19	1	0	0	88	52	0	1	85	100	3
1896	...	...	27	79	46	0	3	1	156	6	4	1	0	4
1897	...	...	0	13	43	1	6	67	120	9	0	55	42	0
1898	...	...	0	16	13	0	0	0	0	0	0	0	0	0
1899	...	...	0	0	0	1	6	234	1,113	54	1	1	25	3
1900	...	...	1	4	54	55	1	49	94	18	0	15	19	9
1901	...	...	6	22	100	3	45	61	93	52	7	10	27	12
1902	...	...	15	24	24	10	12	54	564	9	3	4	4	0
1903	...	...	13	22	16	24	25	117	100	9	9	19	61	3
1904	...	...	0	6	1	0	0	0	1	0	0	1	12	16
1905	...	...	10	1	4	30	27	10	255	489	9	15	36	0
1906	...	...	19	54	30	1	1	28	49	48	13	10	40	7
1907	...	...	174	52	34	13	3	7	346	198	16	25	84	3
1908	...	...	6	34	72	15	28	204	36	4	3	10	4	4
1909	...	...	3	6	76	6	9	439	70	9	1	3	13	10
1910	...	...	61	15	15	3	0	1	73	64	13	24	15	3
1911	...	...	4	21	10	13	13	84	69	4	15	21	12	3
1912	...	...	15	15	88	13	31	39	559	927	15	6	3	1
1913	...	...	13	13	55	21	9	51	174	9	15	18	57	4

APPENDIX LVII.

Statement showing the number of patients admitted into the infectious diseases Hospital, Gaya and suffering from Cholera during the years 1910-14, the number who were discharged cured, and the number who died.

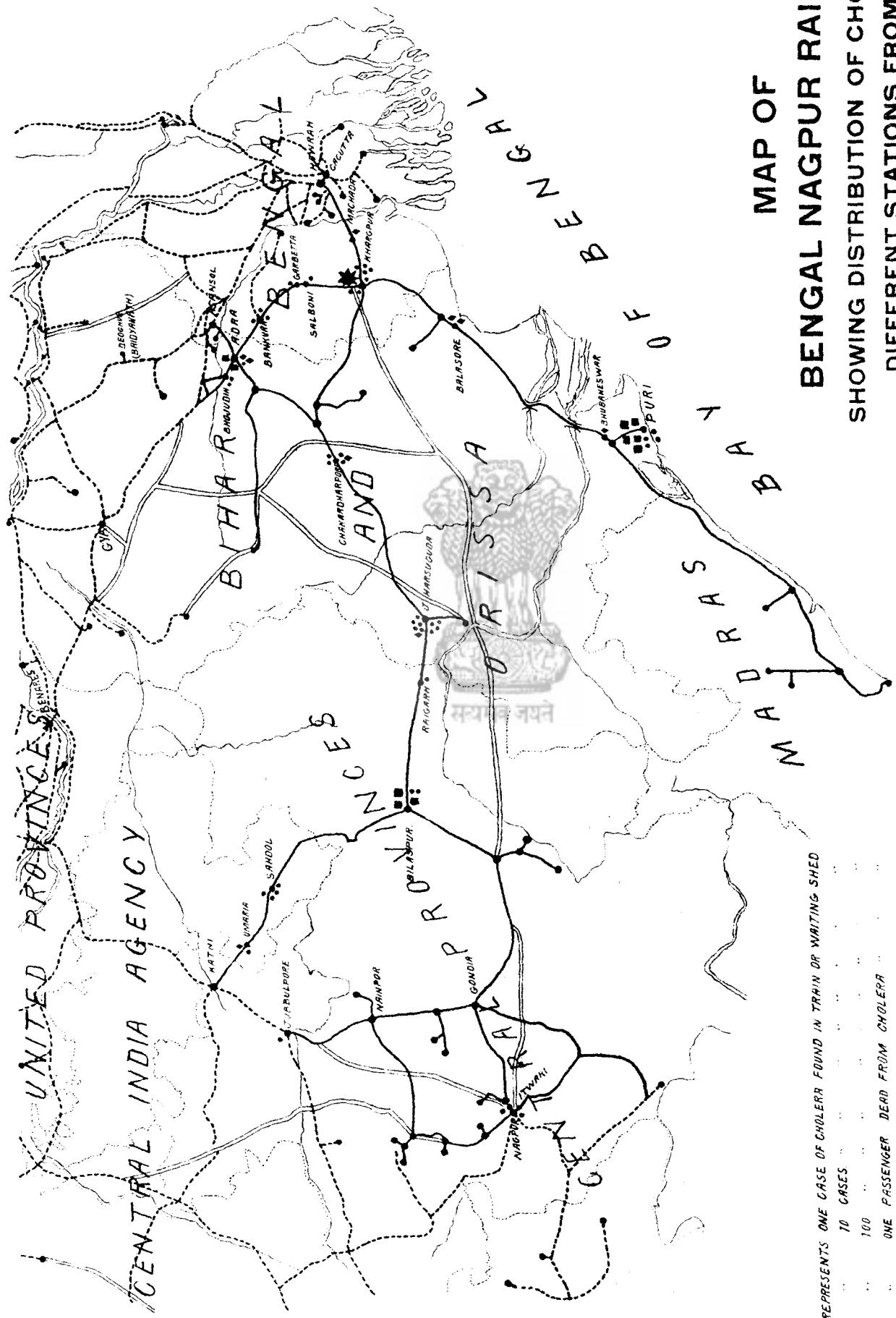
Month.	1910.			1911.			1912.			1913.			1914.		
	Admitted.	Cured.	Died.	Admitted.	Cured.	Died.	Admitted.	Cured.	Died.	Admitted.	Cured.	Died.	Admitted.	Cured.	Died.
January	...	1	0	1	0	0	0	0	0	0	0	0	0	0	0
February	...	1	0	1	1	0	1	3	0	3	3	2	1	0	0
March	...	18	3	15	1	0	1	2	1	1	23	5	18	4	1
April	...	9	4	5	0	0	0	2	1	1	3	0	3	1	1
May	...	0	0	0	1	0	1	1	0	4	0	0	0	1	0
June	...	2	2	0	2	0	2	2	1	3	3	2	1	7	3
July	...	2	1	1	3	1	2	23	9	14	8	3	5	7	5
August	...	7	2	5	7	4	3	9	3	6	7	3	4	2	1
September	...	63	10	13	49	13	36	14	3	11	22	11	11	22	6
October	...	12	4	8	47	10	37	18	3	15	4	4	0	1	0
November	...	1	0	1	3	1	2	4	0	4	3	0	3	1	0
December	...	2	0	2	0	0	0	0	0	0	0	0	0	0	0
Total	...	118	27	92	114	29	85	78	21	57	76	30	46	46	18
Percentage of recoveries.			22.0			25.4			26.9			39.5			39.1
Total deaths from Cholera in Gaya.			396			593			331			542			216
Percentage of total Cholera deaths which occurred out of hospital.			76.8			85.7			82.8			91.5			87.0



PLAN OF CHOLERA HOSPITAL COMPOUND AT GAYA.

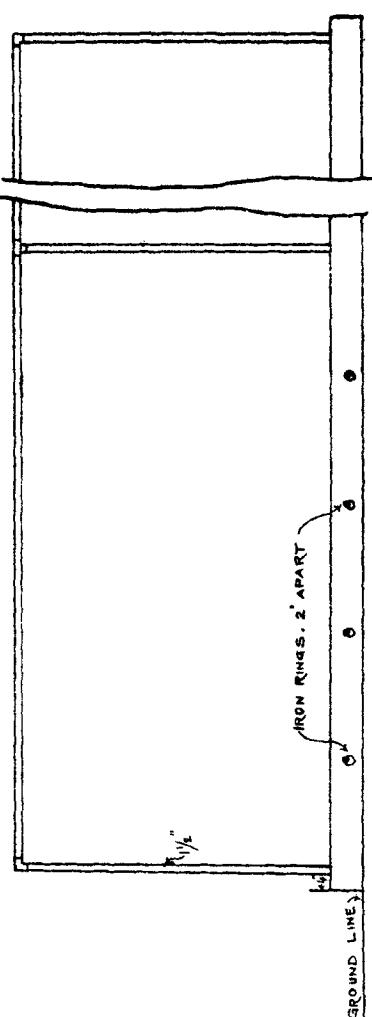
SCALE 100 = 1 INCH.

MAP OF
BENGAL NAGPUR RAILWAY
SHOWING DISTRIBUTION OF CHOLERA TO
DIFFERENT STATIONS FROM PURI
DURING JULY 1912.



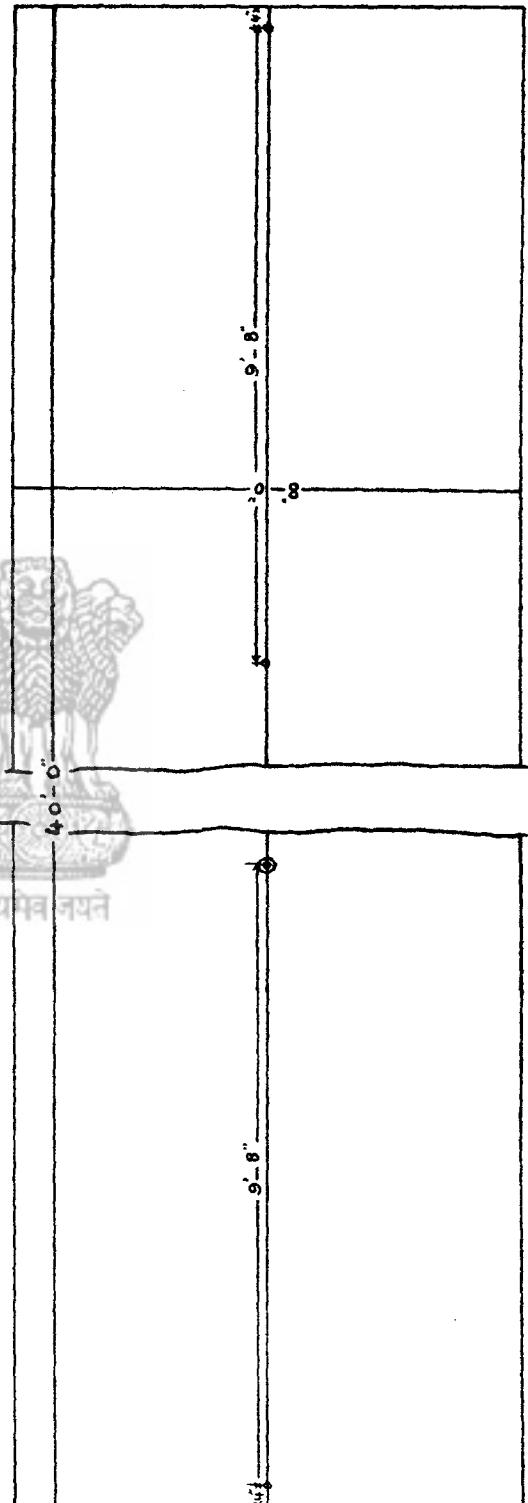
DETAILS OF PILGRIM SHELTERS

SCALE OF FEET.

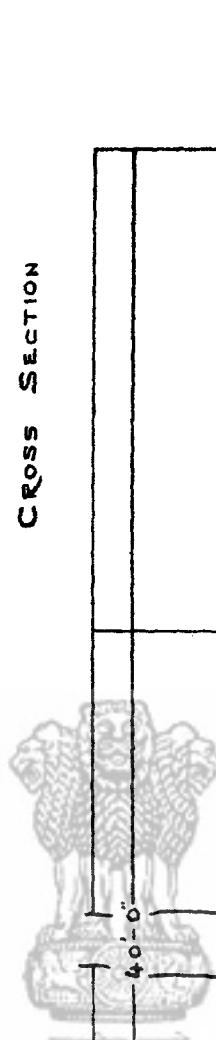


ELEVATION

CROSS SECTION

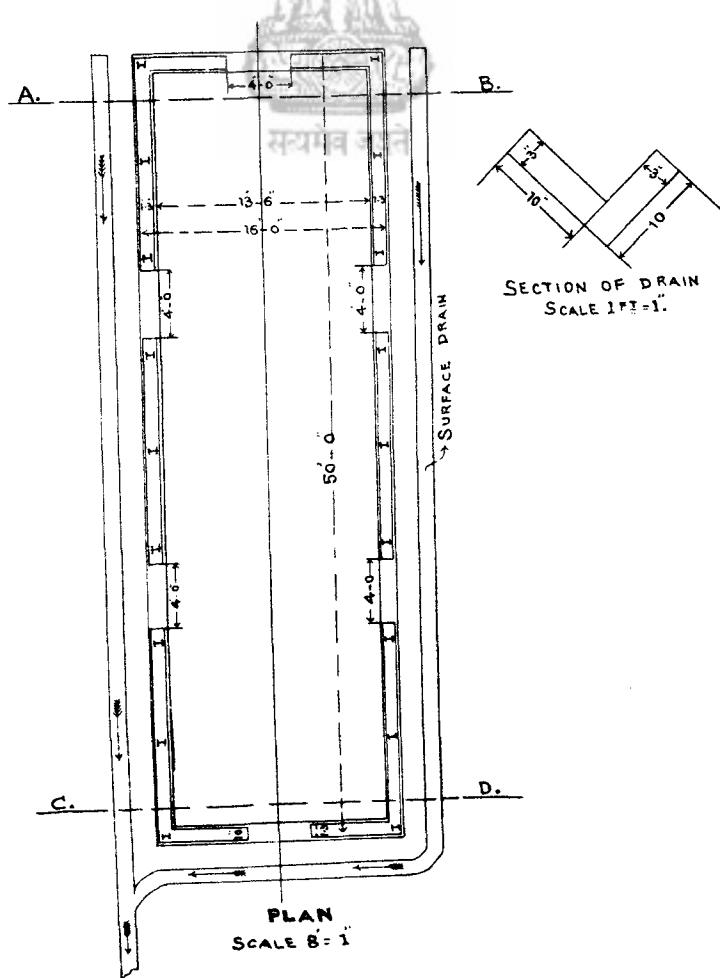
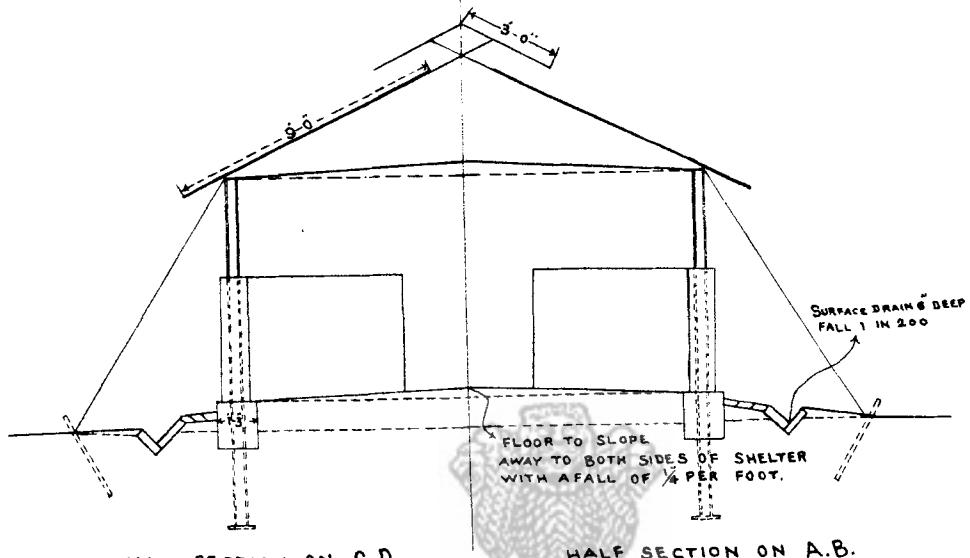


PLAN

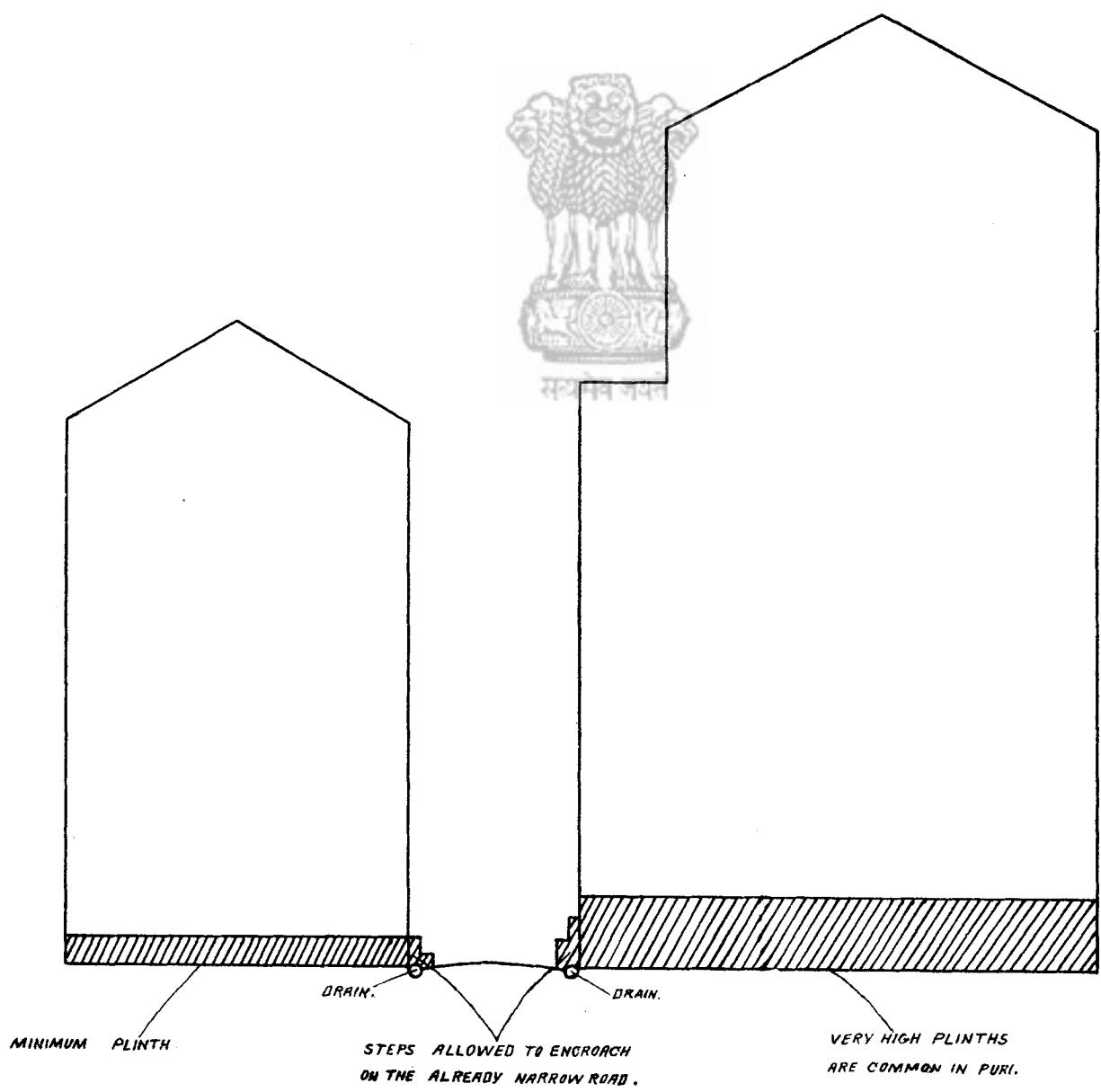


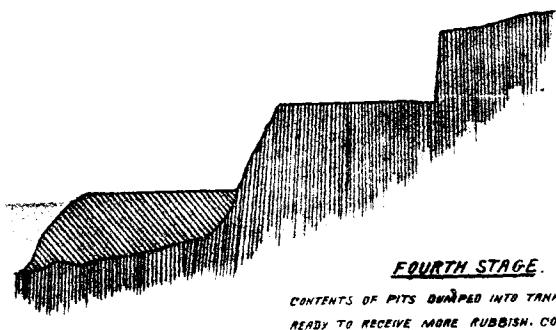
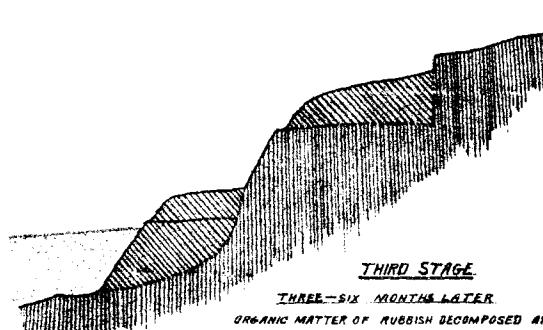
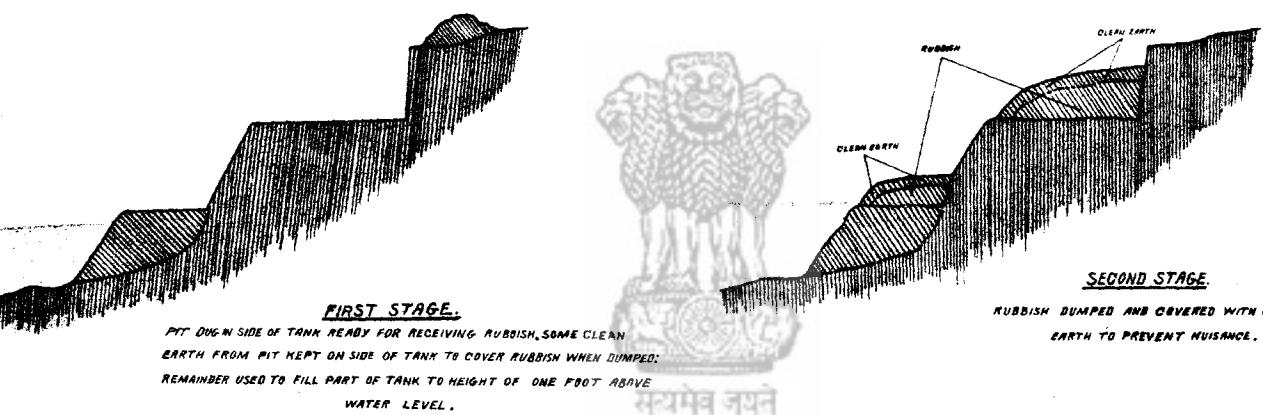
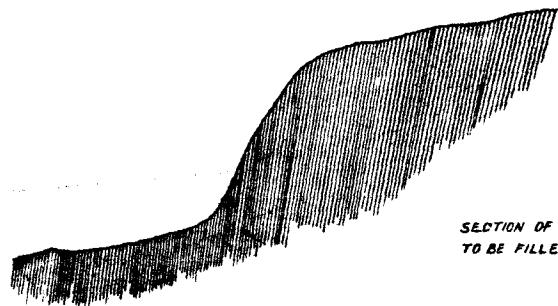
ALTERNATIVE DESIGN
FOR
PILGRIM SHELTER
WHERE THE CHIEF FESTIVAL OCCURS
DURING THE RAINY SEASON

SCALE 6 = 1.



IMAGINARY CROSS SECTION OF A ROAD 12 FEET BROAD.

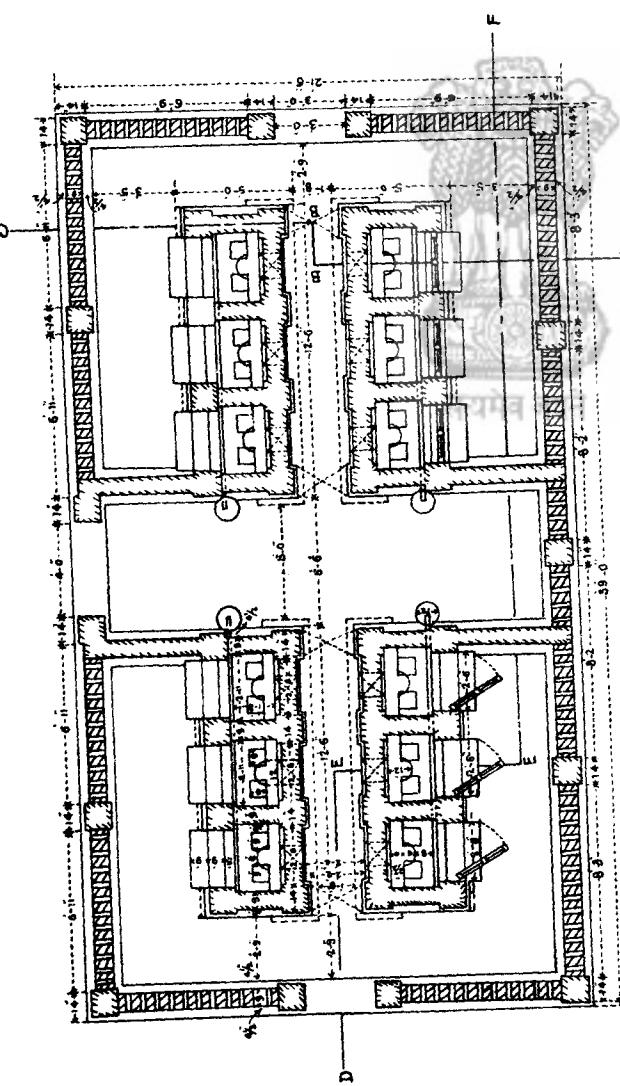




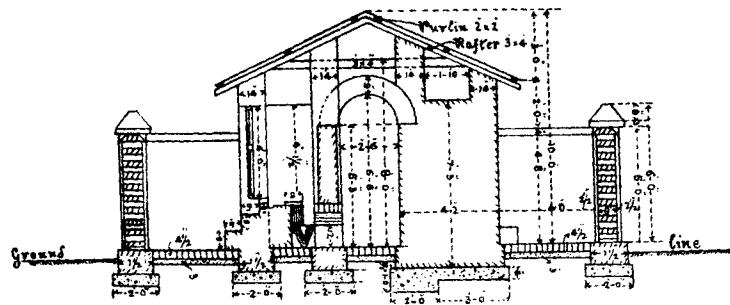
METHOD OF DUMPING SHOWN DIAGRAMATICALLY.

BALLIA TYPE LATRINE

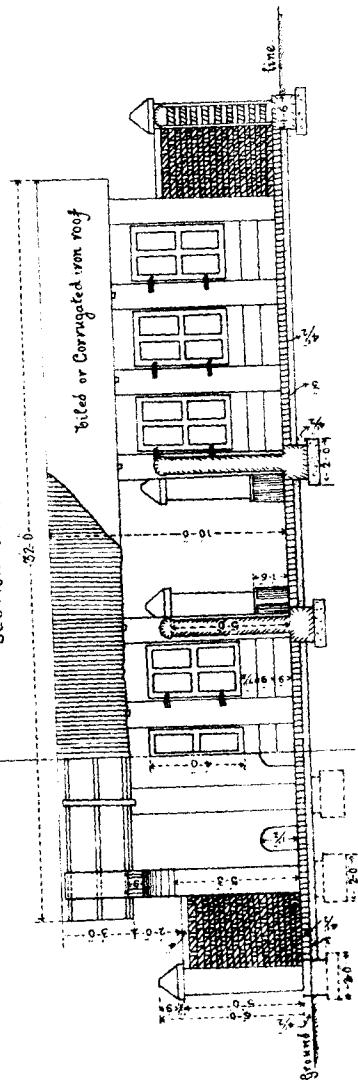
Scale 8 feet to 1 inch.



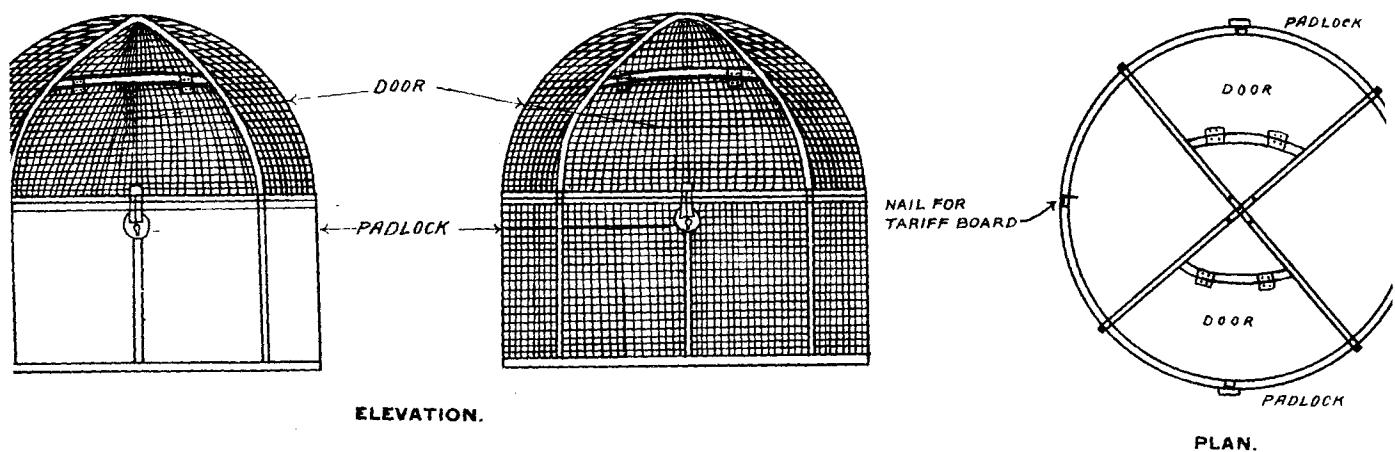
SECTION ON A.B.C.



SECTION ON D.E.F.

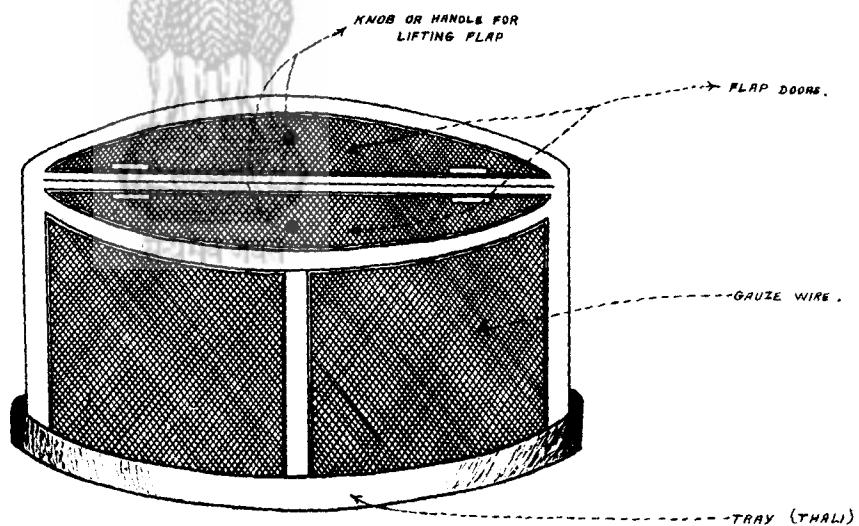


**SKETCH OF FLY-PROOF SWEETMEAT TRAY
AS USED ON B. B. & C. I. RAILWAY.**

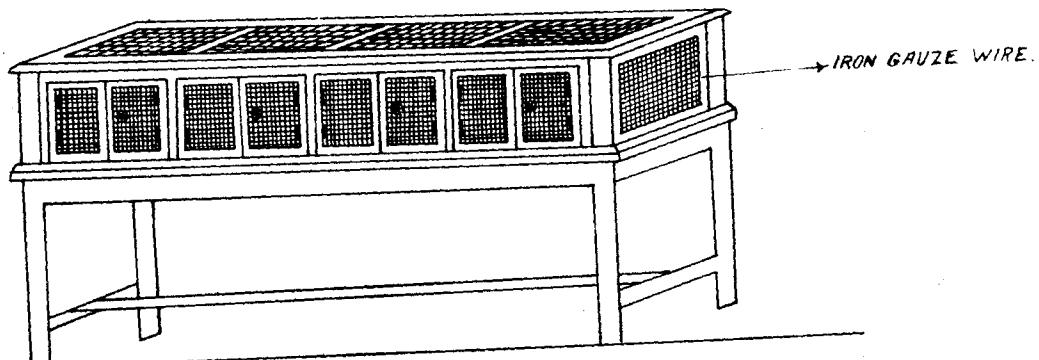


**FLY-PROOF SWEETMEAT TRAY USED
ON G. I. P. RAILWAY.**

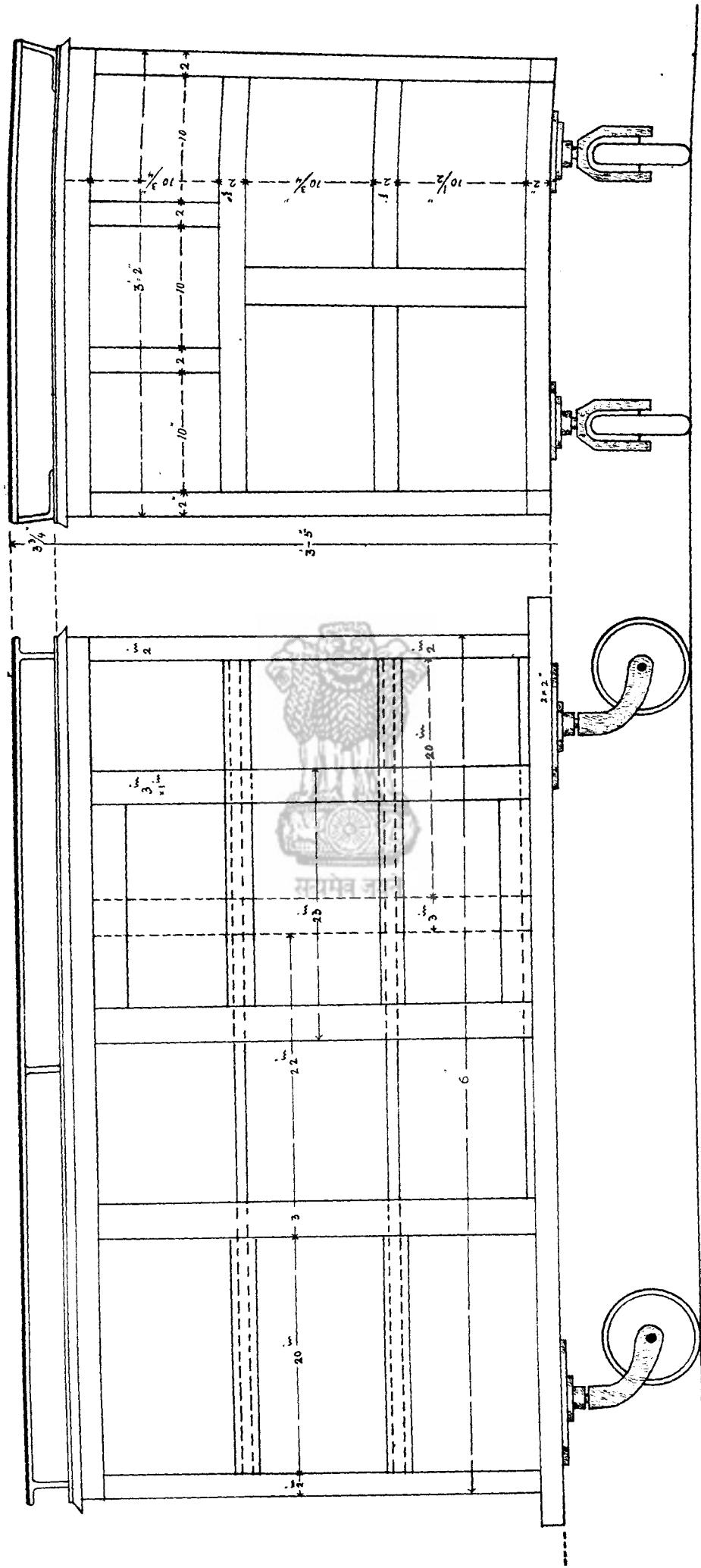
APPENDIX XXIII.



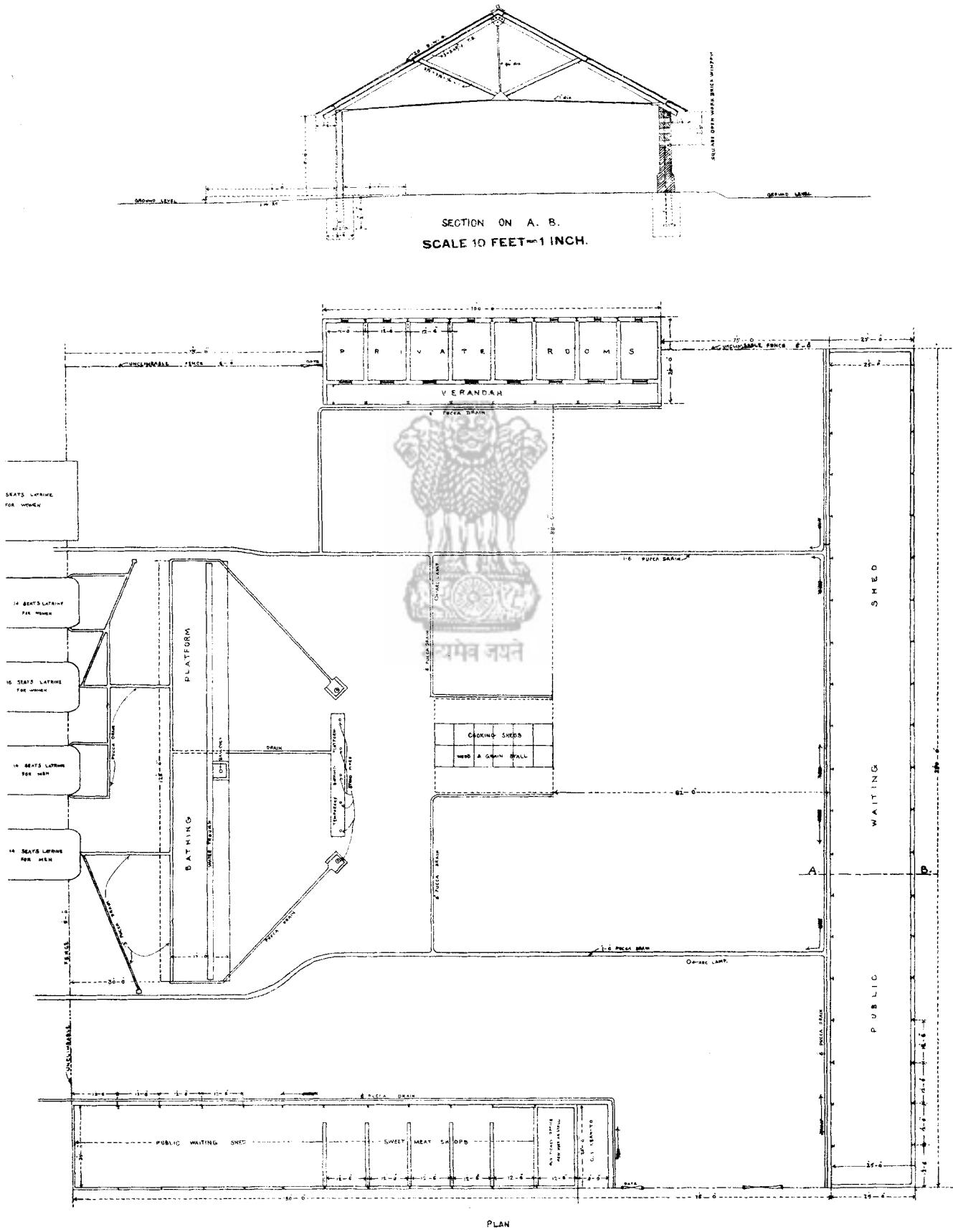
APPENDIX XXIV.



FLY PROOF TROLLEY.

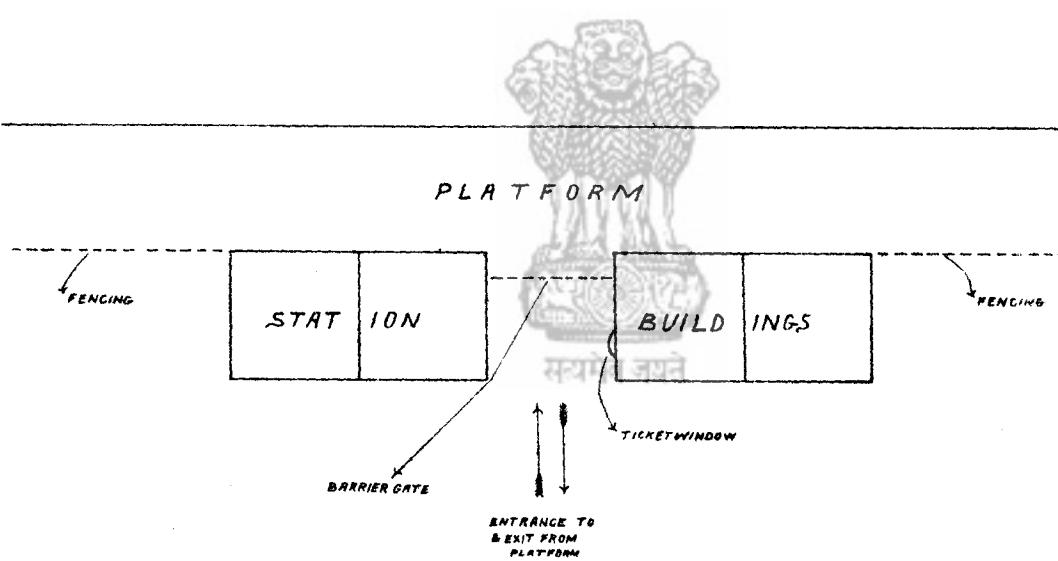


PLAN OF PILGRIM SERAI
AT KHARGPUR JUNCTION.

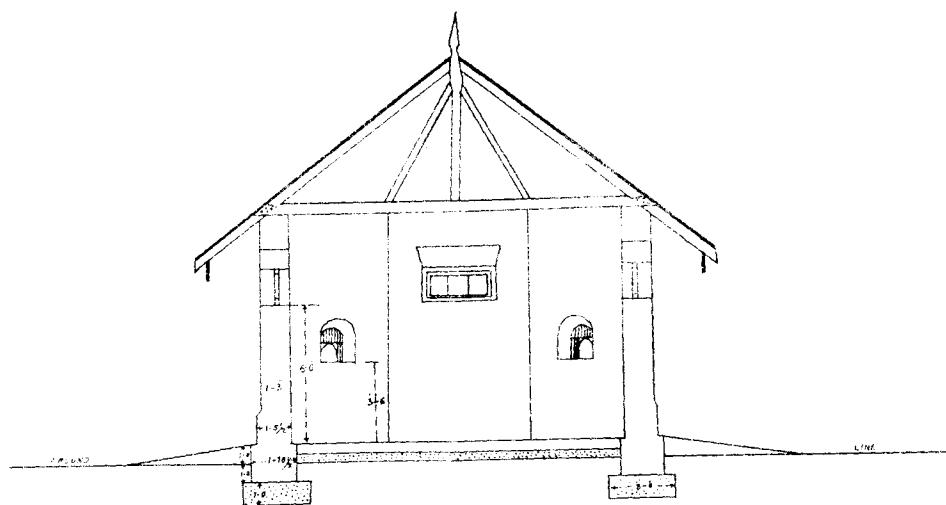


SCALE 40 FEET=1 INCH.

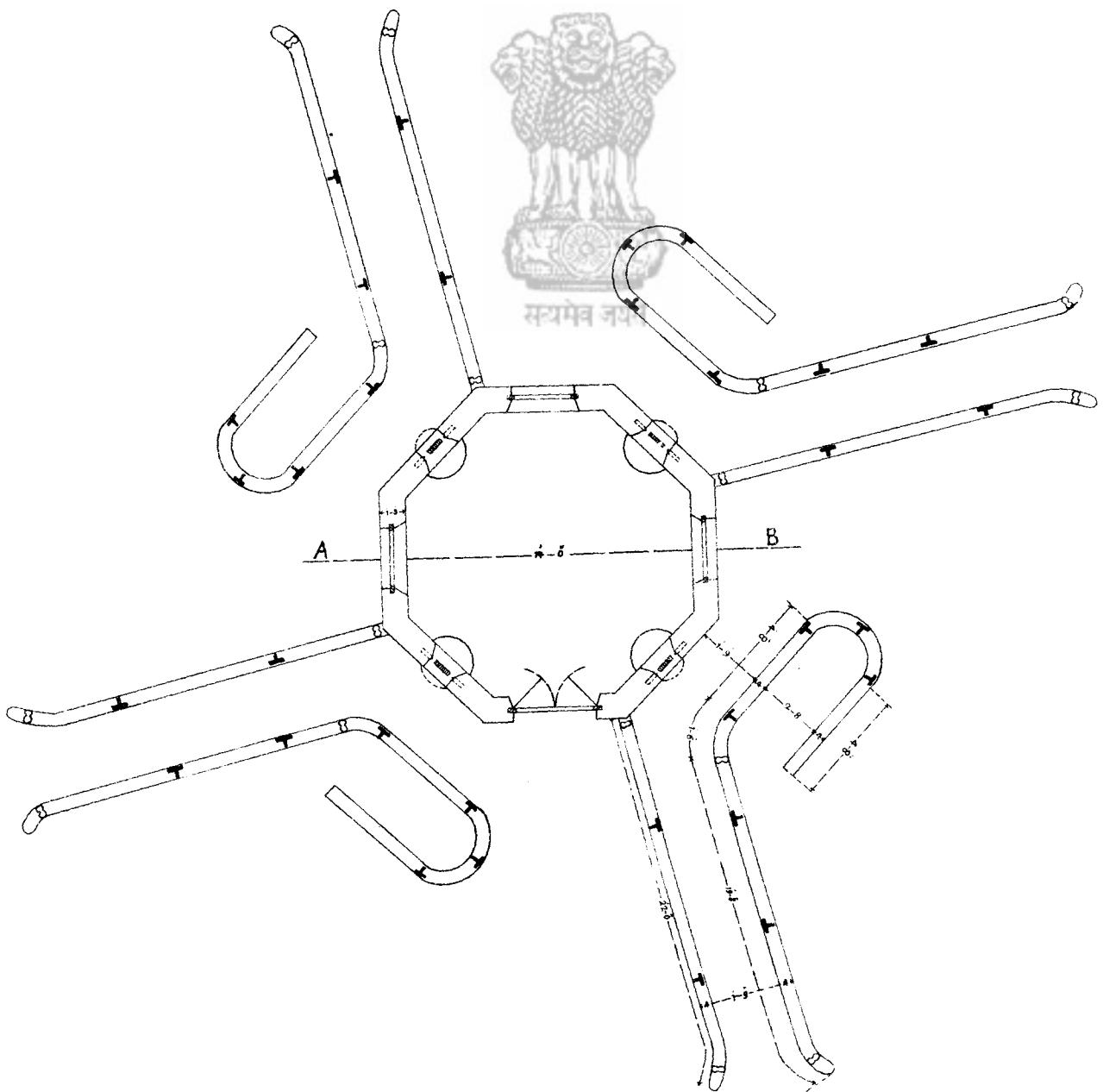
SITUATION OF RAILWAY
BOOKING OFFICE.



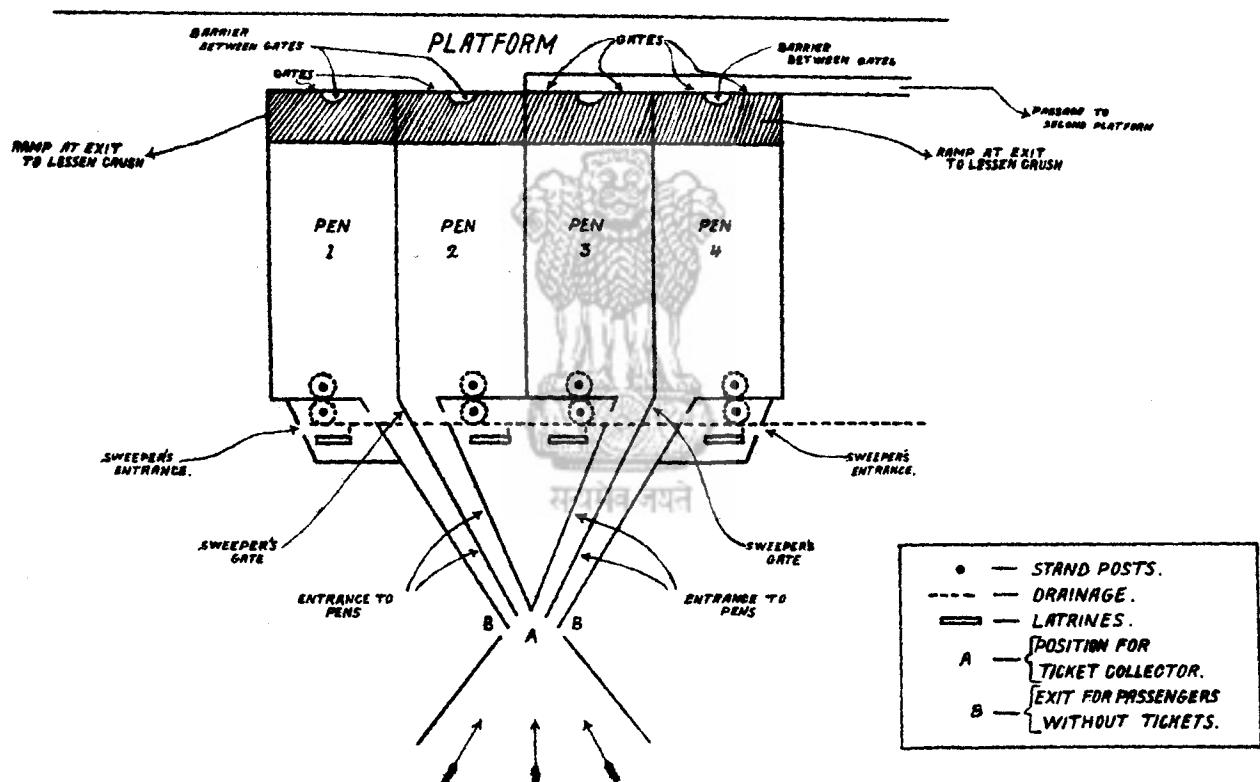
BARRIERS AT BOOKING OFFICE.



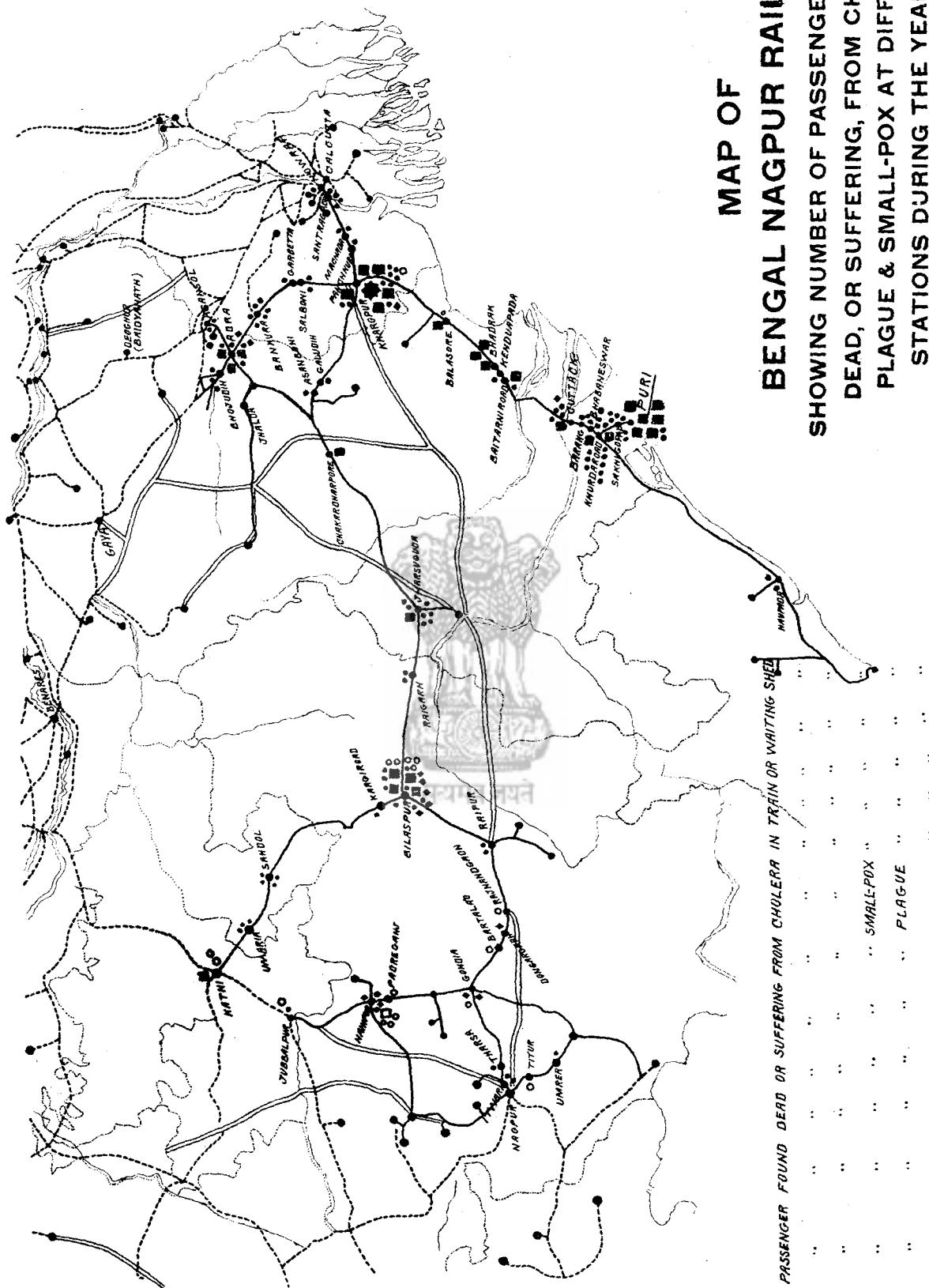
SECTION ON A.B.



PENS FOR PILGRIMS.

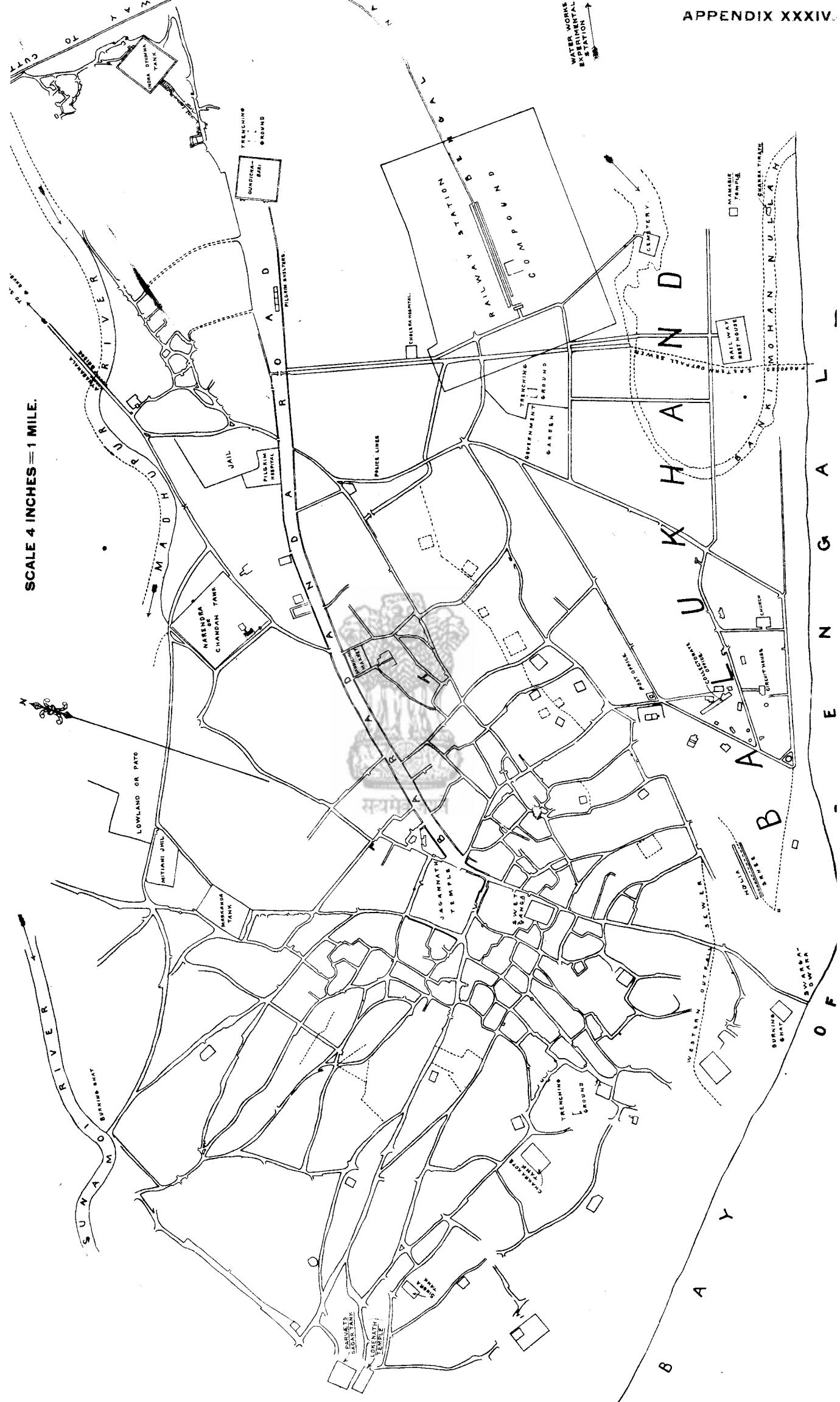


MAP OF
BENGAL NAGPUR RAILWAY
SHOWING NUMBER OF PASSENGERS FOUND
DEAD, OR SUFFERING, FROM CHOLERA,
PLAQUE & SMALL-POX AT DIFFERENT
STATIONS DURING THE YEAR 1912.



• ■ ◆ ○ □

SCALE 4 INCHES = 1 MILE.

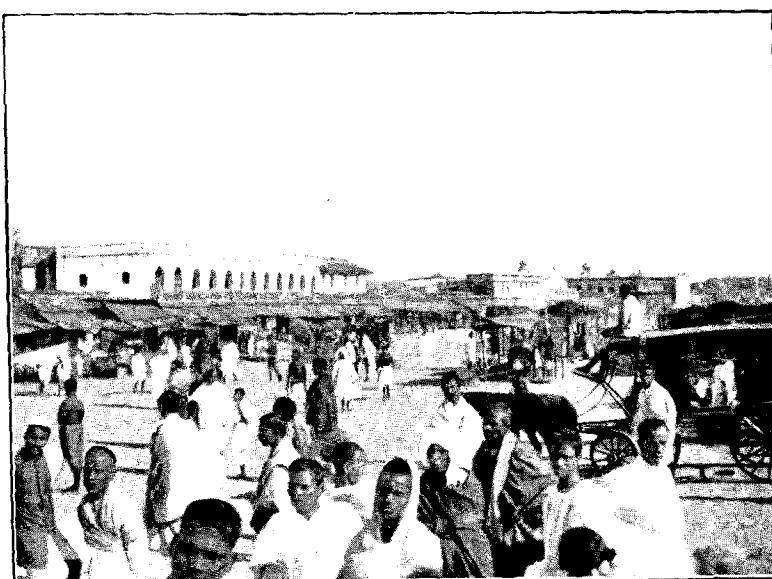




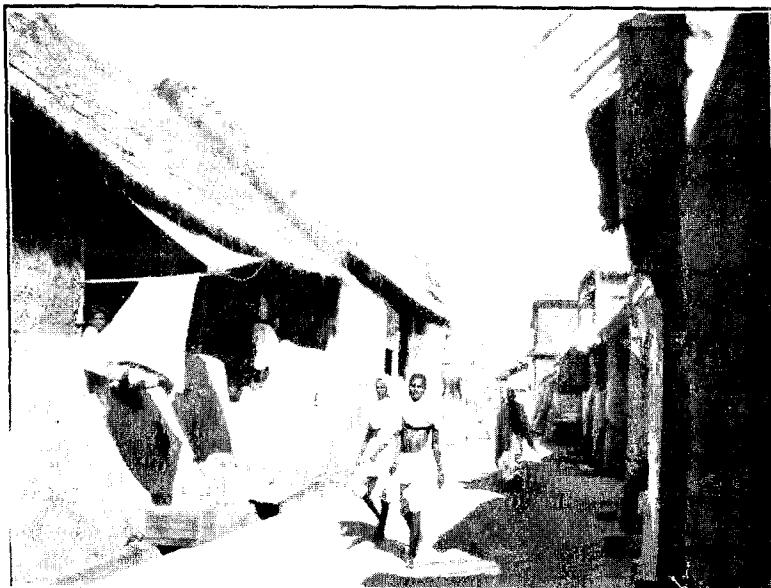
Lions' Gate of Temple of Jagannath
Shows the broad open space formed by western end of Bara Danda.



Bara Danda (eastern portion) from gate of the Gandichabari or Garden House.



Bara Danda.—Western portion near Temple of Jagannath.



A

Main Street leading to Swargadwara—very narrow with houses on excessively high plinths on each side, houses of bamboo and mud with thatch roofs.



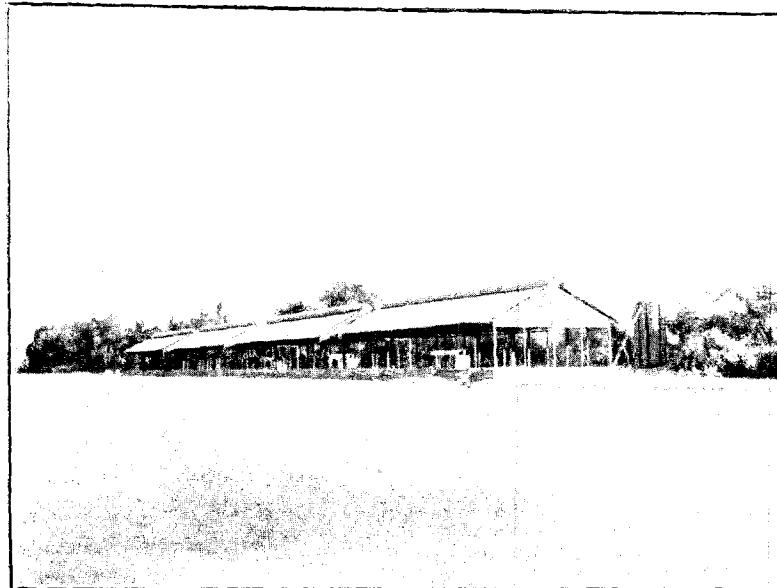
B

Main Street—openings of numerous cesspools in plinths.

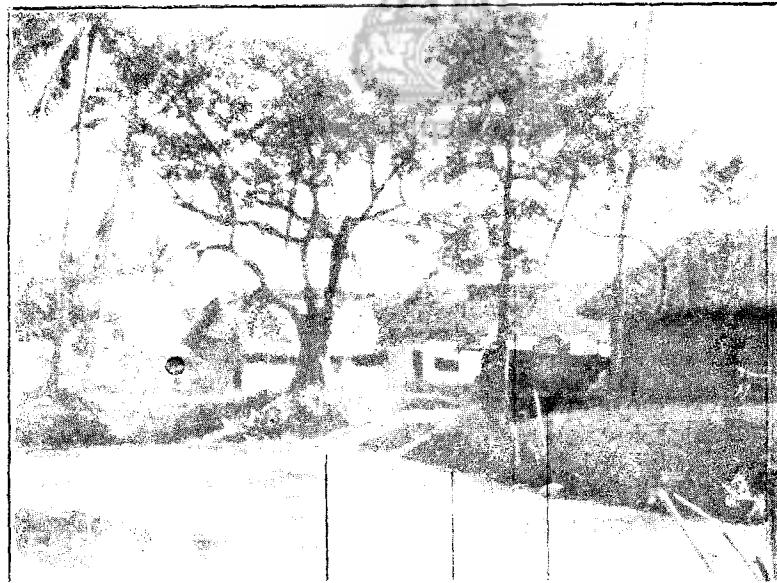


C

Main Street to Markanda Tank—very narrow houses of masonry on one side and of bamboo mud and thatch on the other—shows similar high plinths.



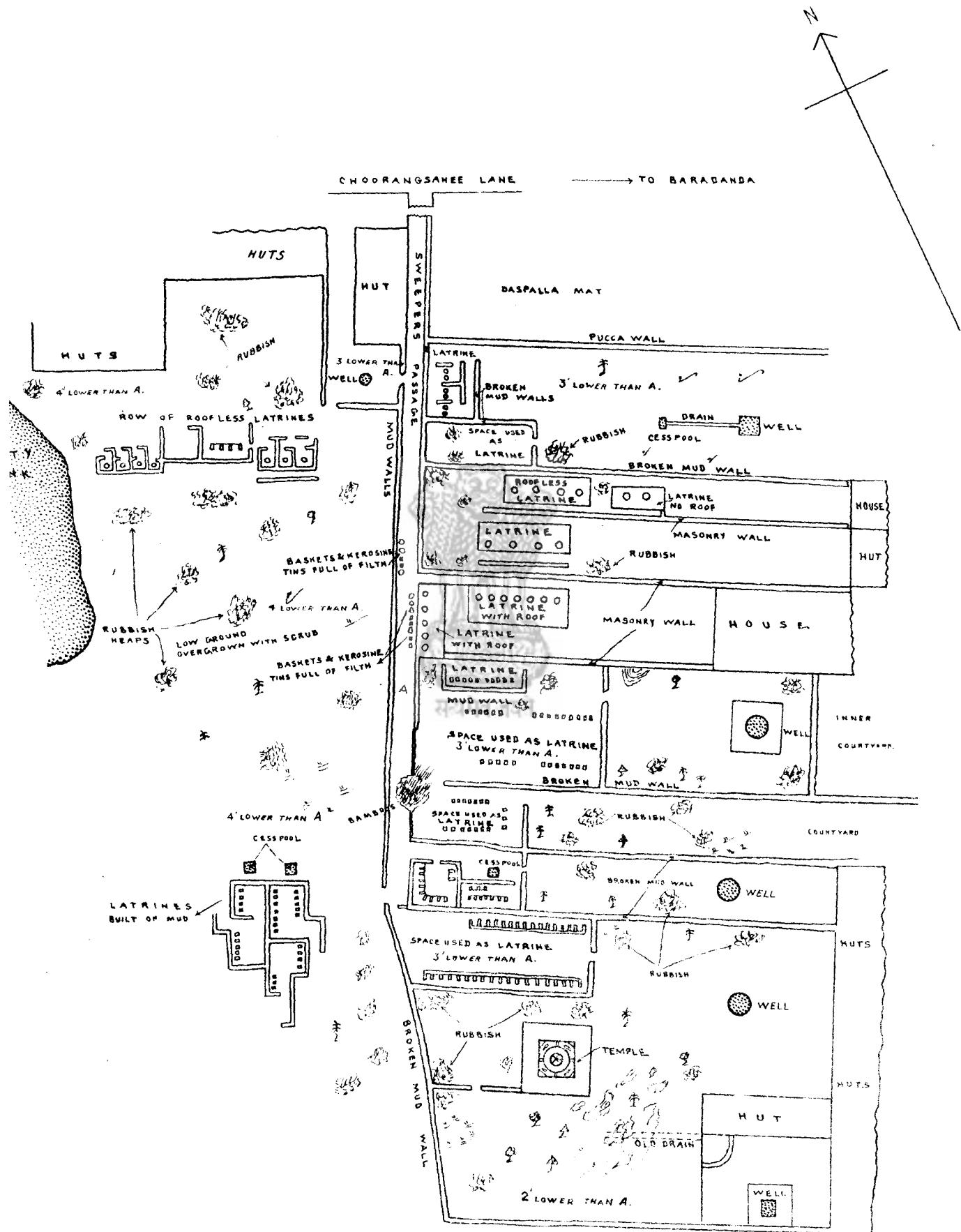
Pilgrim Shelters. The roofs are unnecessarily high and there are no side walls, so that the protection from rain is insufficient.



Typical condition behind houses--dirty tank overgrown with algae. a. Latrine
b. drain from latrine into tank c. place for bathing and washing clothes
and cooking pots.

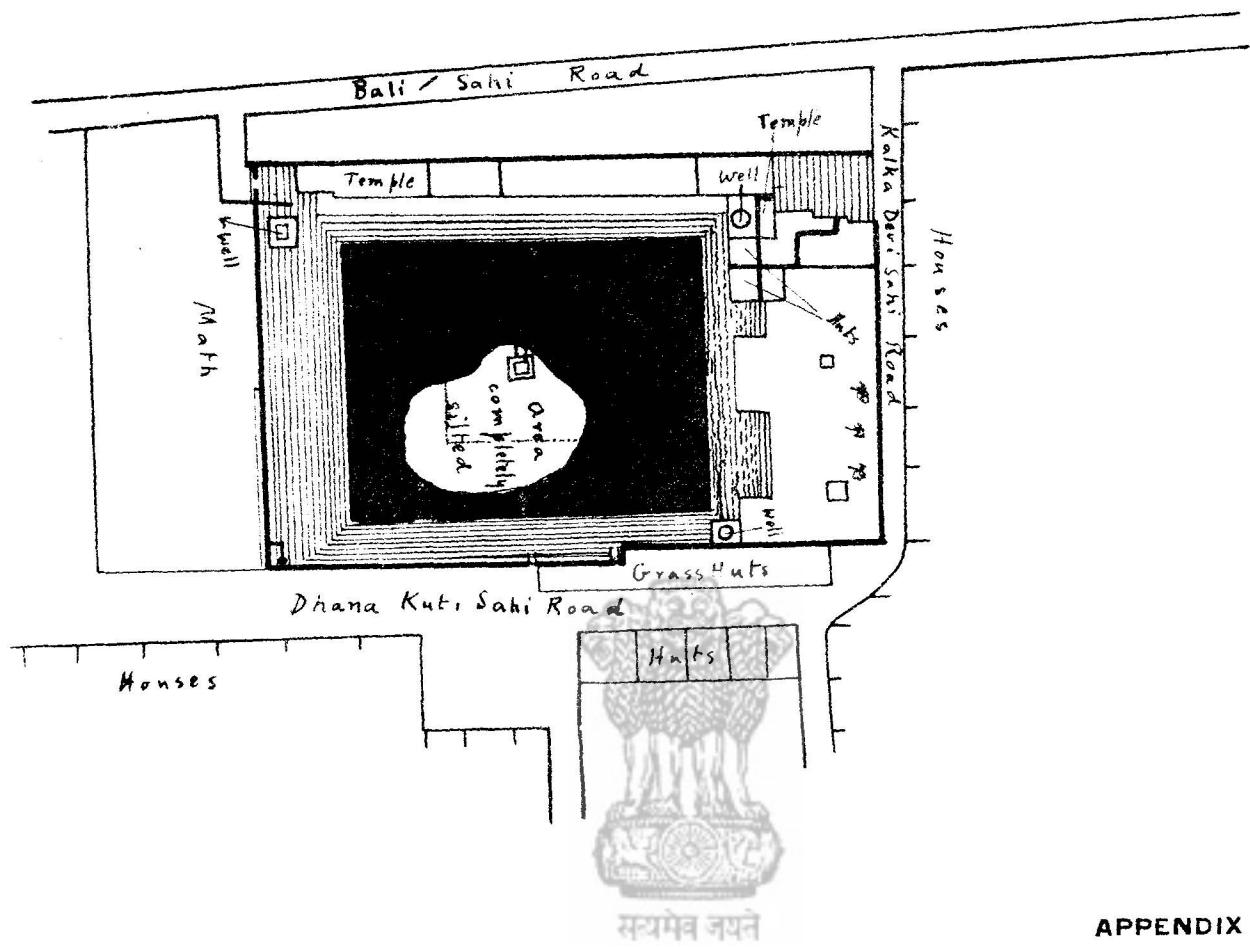
PLAN OF AREA BEHIND HOUSES IN PURI.

SHOWING COMMON ARRANGEMENT OF PRIVATE LATRINES.



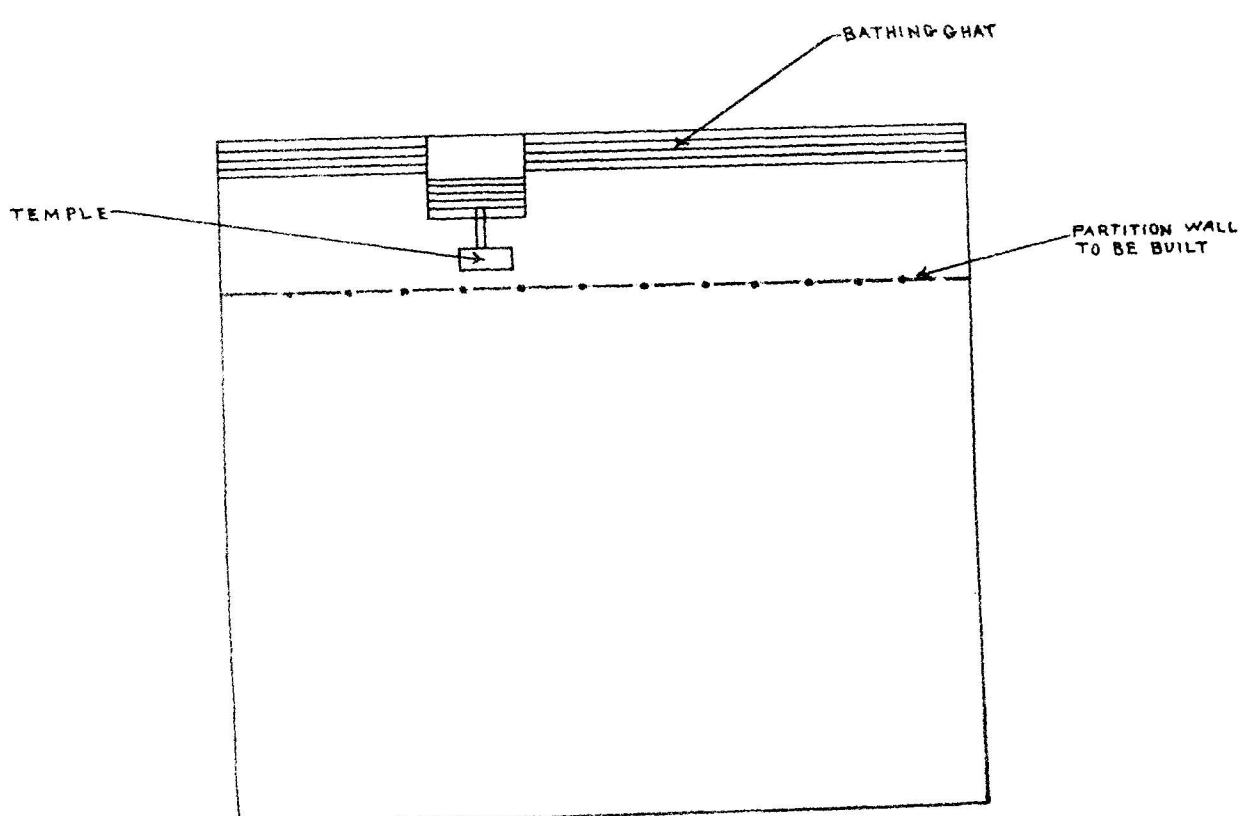
SKETCH PLAN OF SWETGANGA TANK.

SCALE 100' = 1"

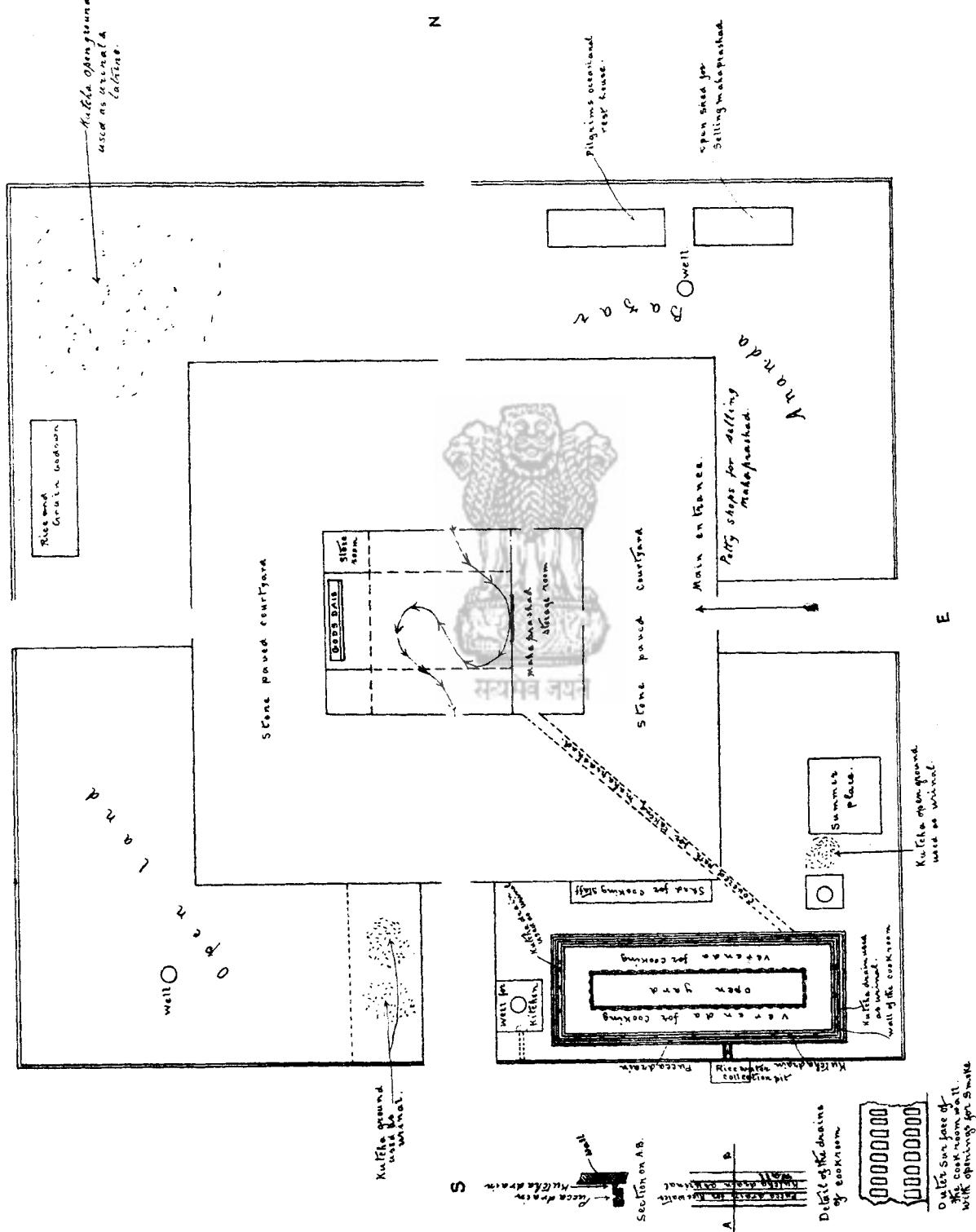


APPENDIX XLIV.

ROUGH SKETCH OF NARENDRA TANK.

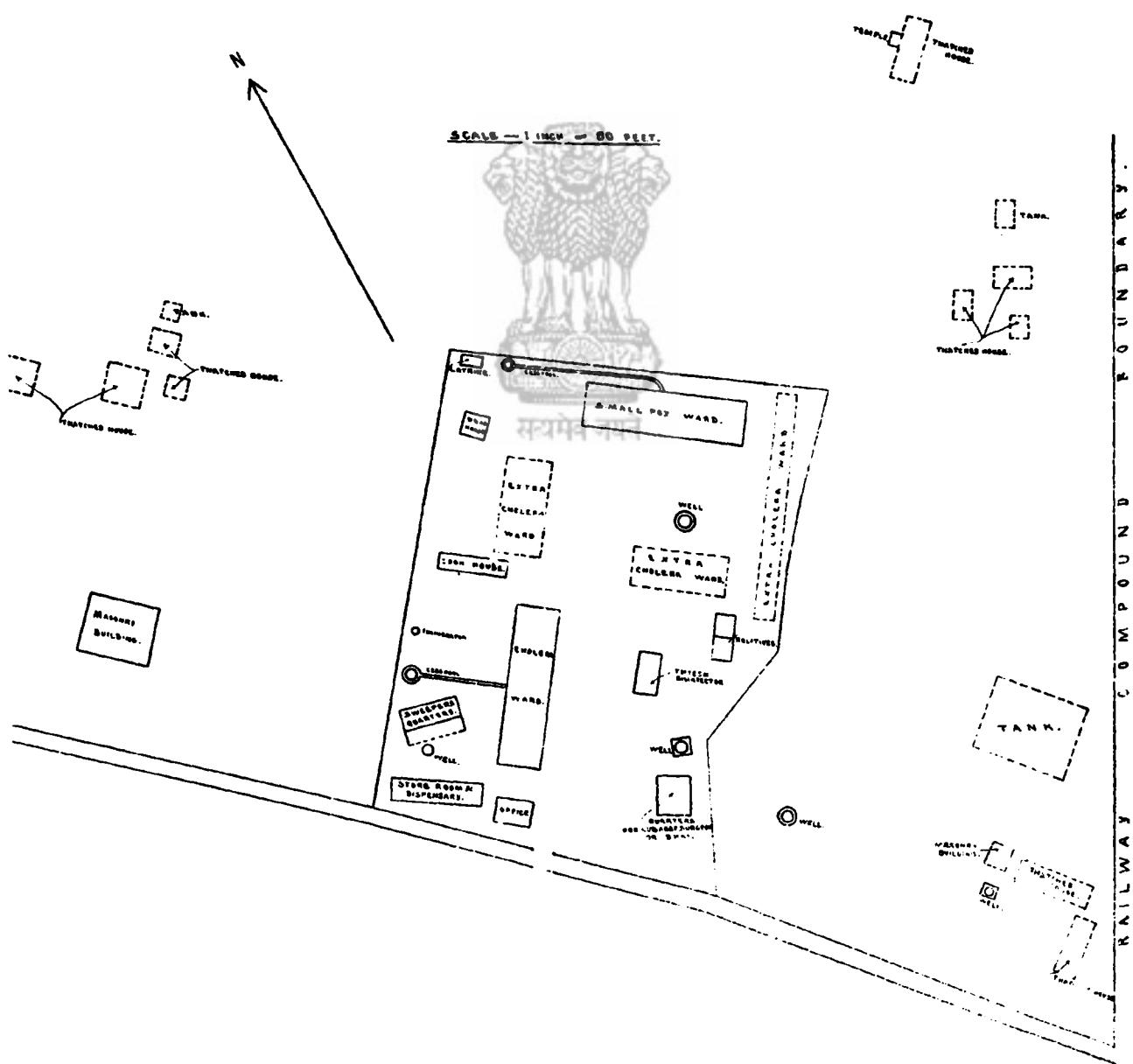


PLAN OF TEMPLE
AT PURI.

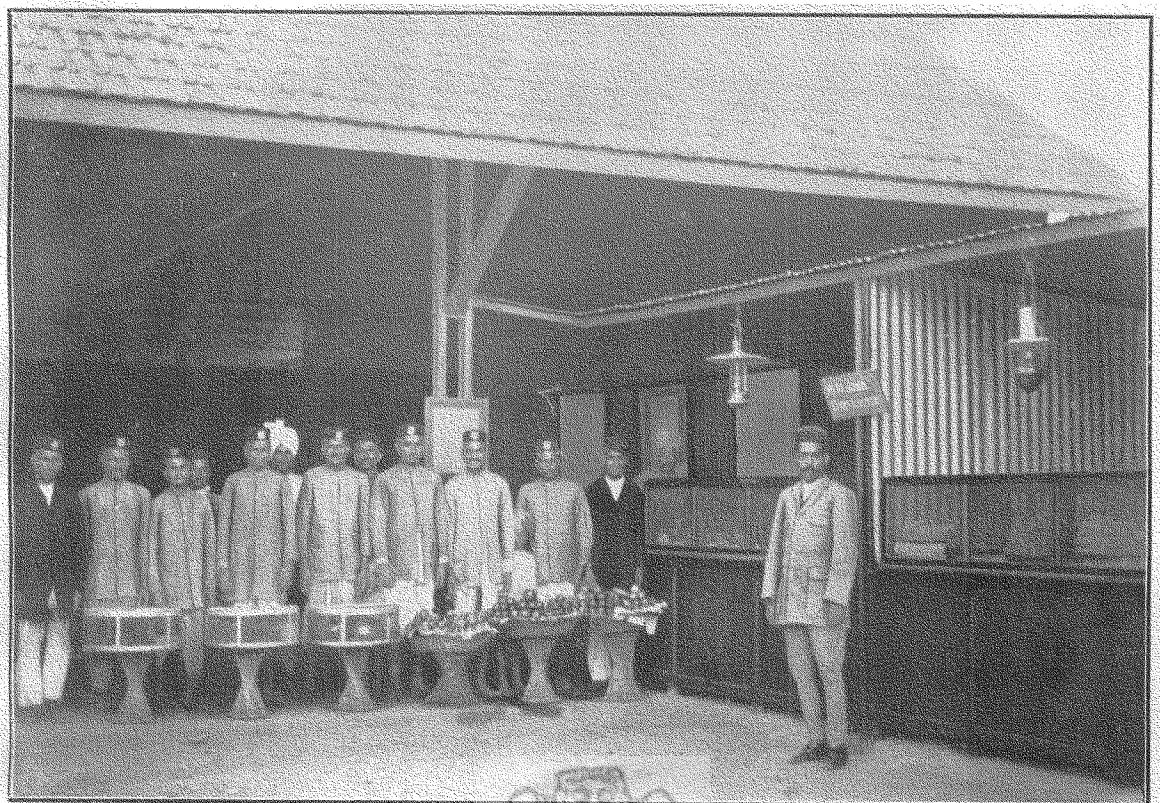


APPENDIX XLVIII.

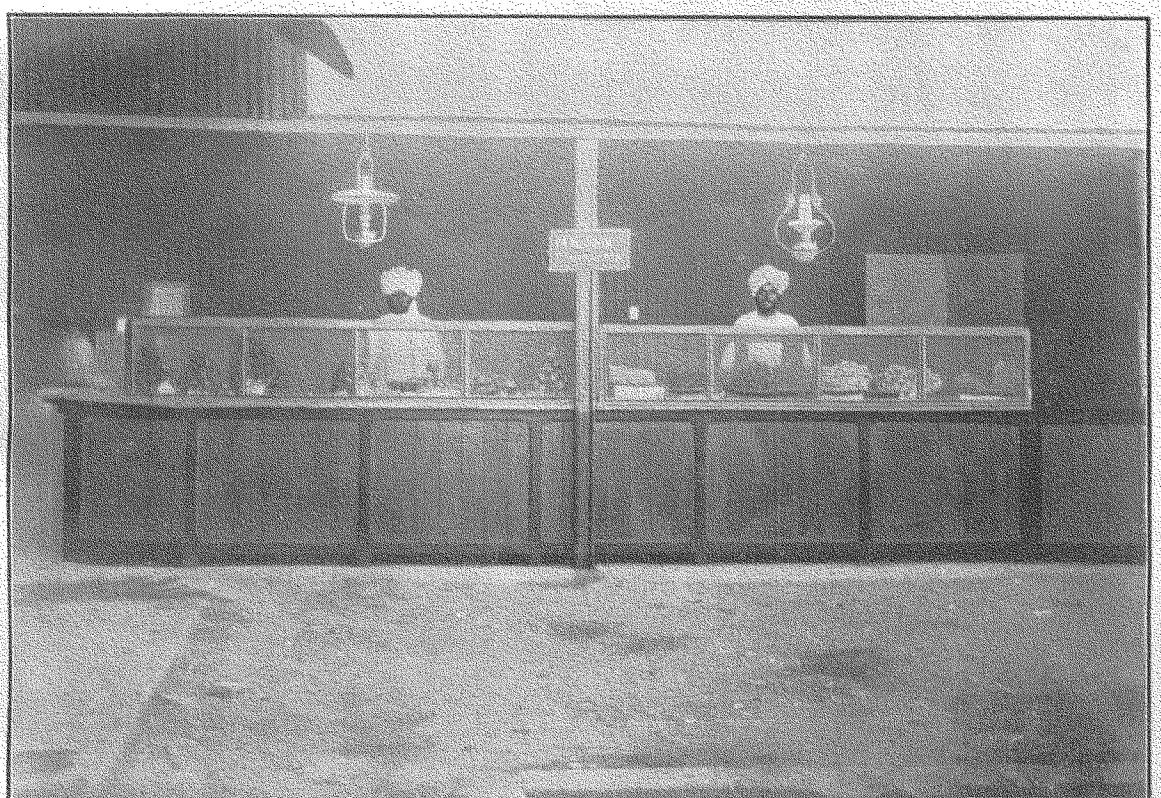
SITE PLAN OF PURI CHOLERA HOSPITAL.



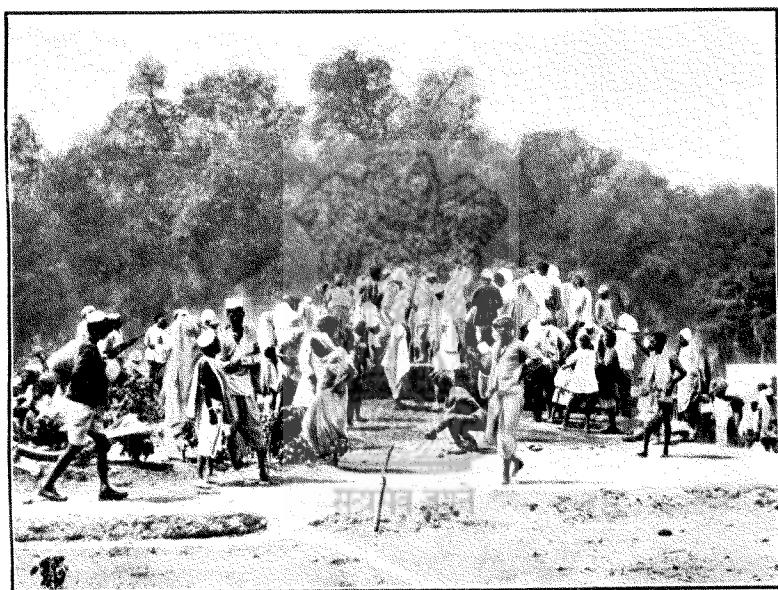
FLY-PROOF SWEETMEAT TRAYS AND COUNTERS AS USED
ON THE GREAT INDIAN PENINSULA RAILWAY



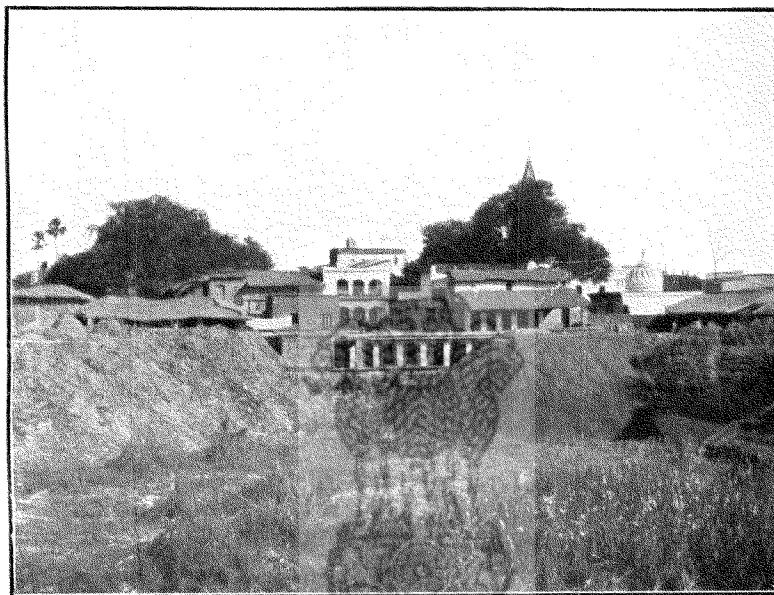
सत्यमेव जयते



APPENDIX XVII.



Shows the huge crowds that gather round the wells to draw water even at an ordinary festival.



Tank of Gaya being filled with rubbish (left) and earth (right) in the wrong way and so as to cause the maximum amount of nuisance. The water in the foreground is so overgrown with weeds as to be almost invisible.

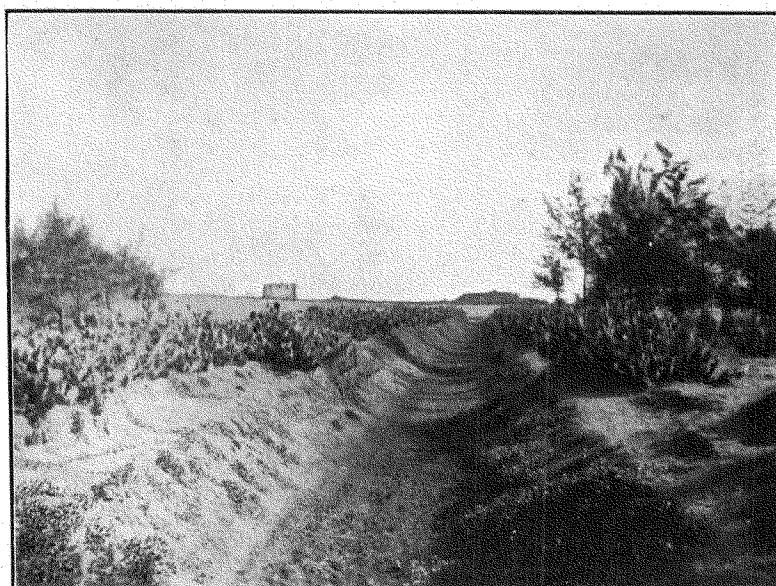
OUTFALL DRAIN. PURI.



Main eastern outfall drain already so silted up that none of masonry is visible; sullage standing in isolated pools along its length.

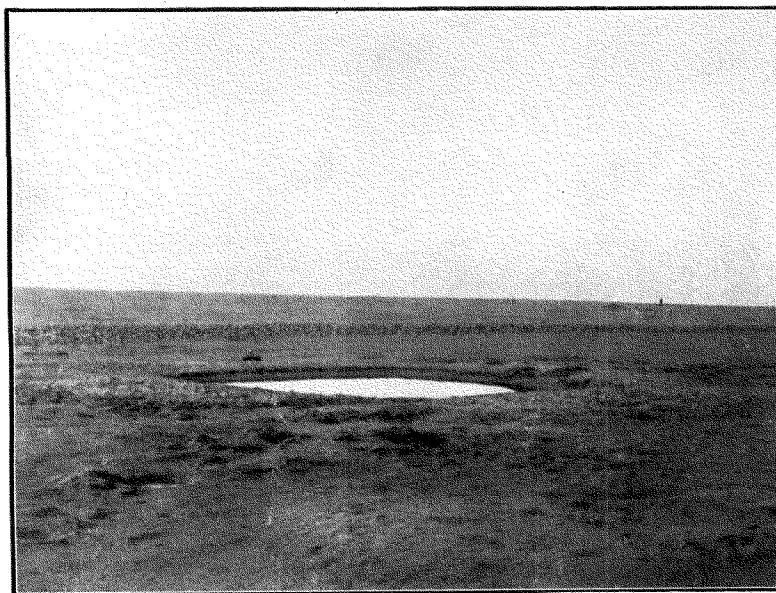


Same but nearer outfall: equally silted: contains little sullage.



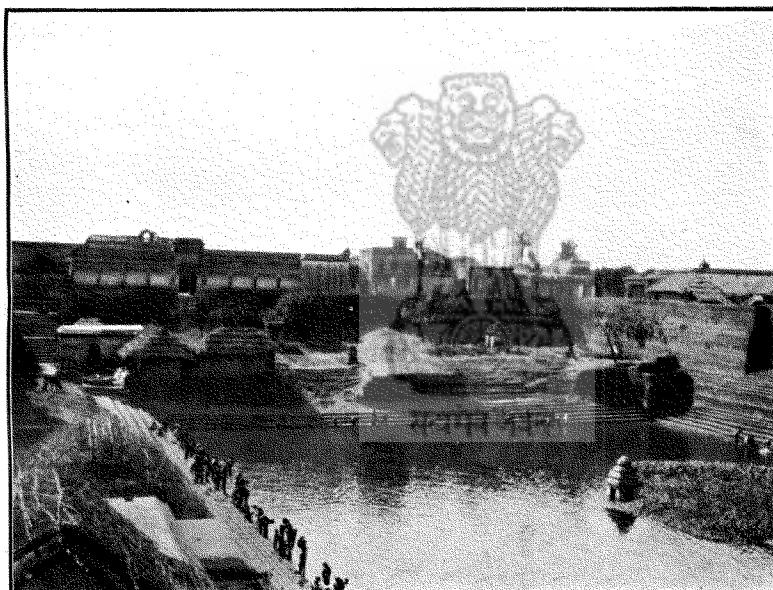
Same but at outfall: here drain is very much silted: no sullage reaches this distance except after rain fall.

SACRED TANKS. PURI.



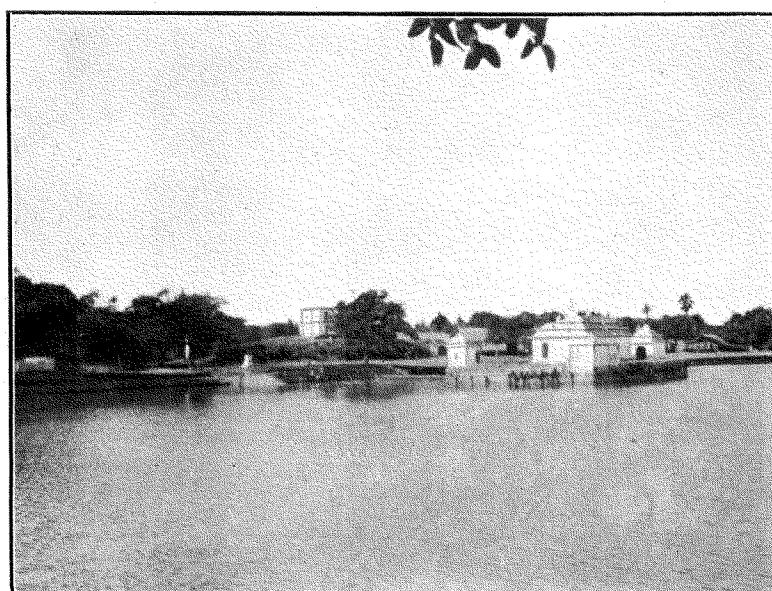
A

Chakra Tirath Tank on site where Jagga-nath was by tradition washed ashore.



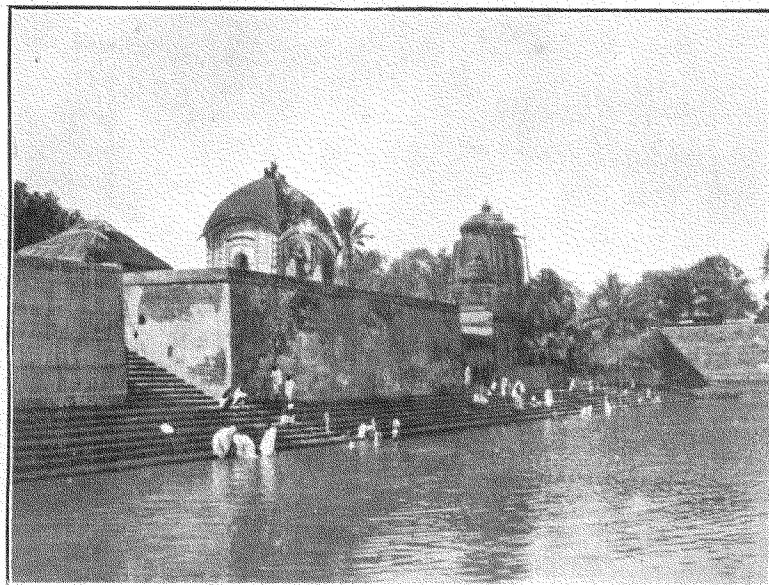
B

Swetganga Tank,



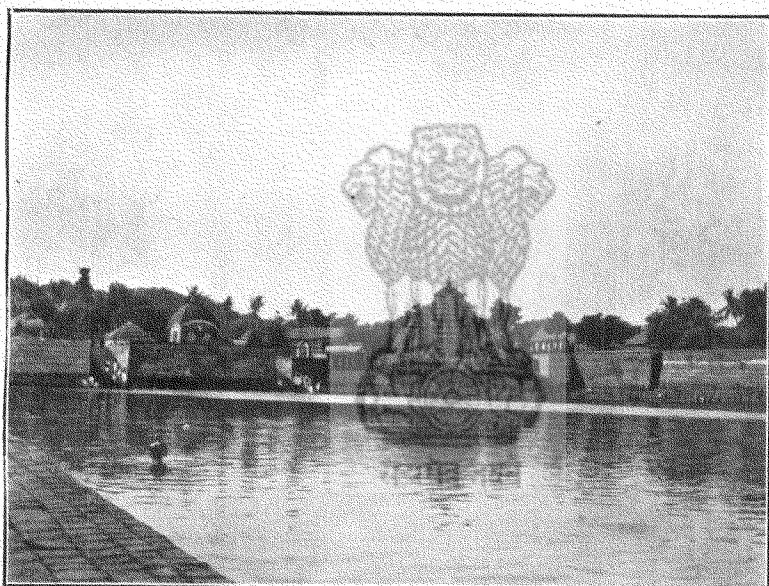
C

Narendra Tank,



A

Markanda Tank—The chief bathing ghat & temples.



B

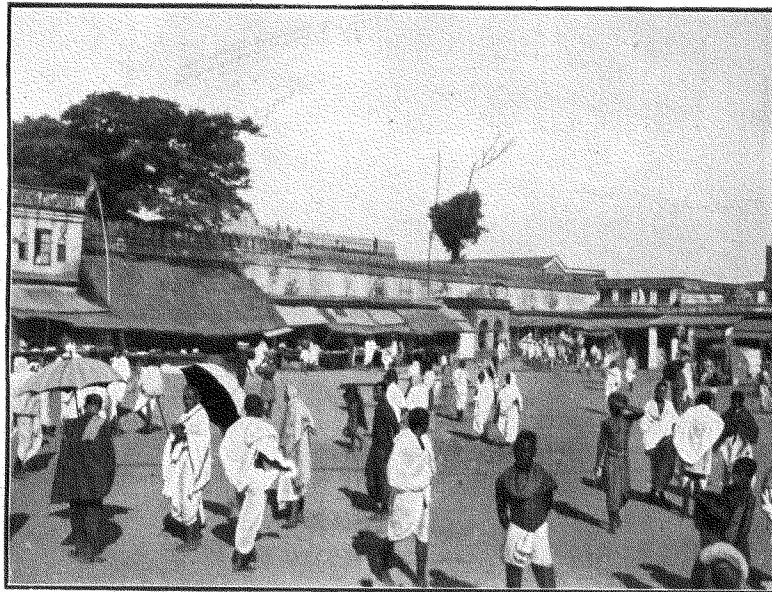
Markanda Temple—General view.



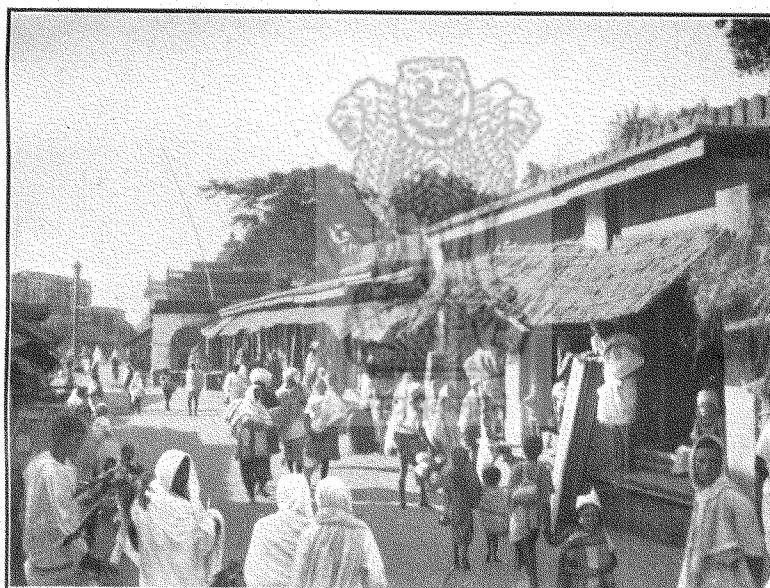
C

Indradayumna Tank.

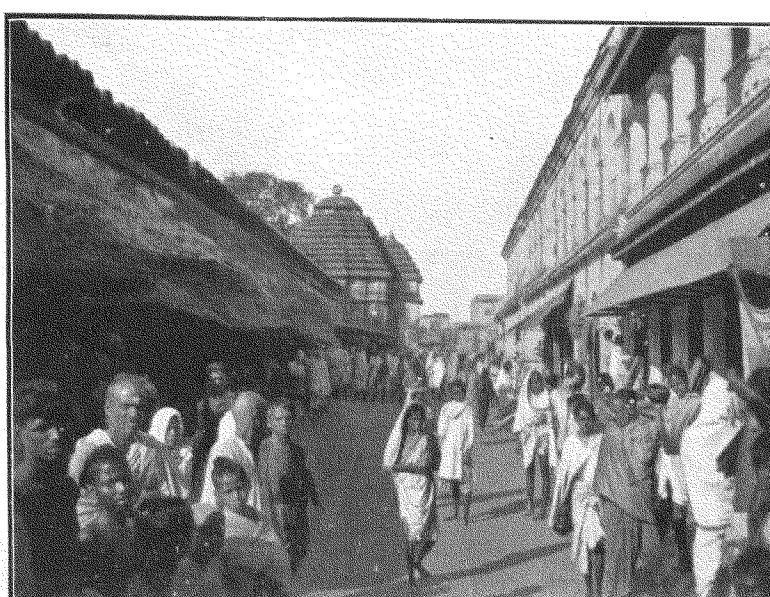
NARROWING OF TWO IMPORTANT THOROUGHFARES
IN PURI.



Shows unsightly shops which have been built along eastern wall of Jagannath's Temple.

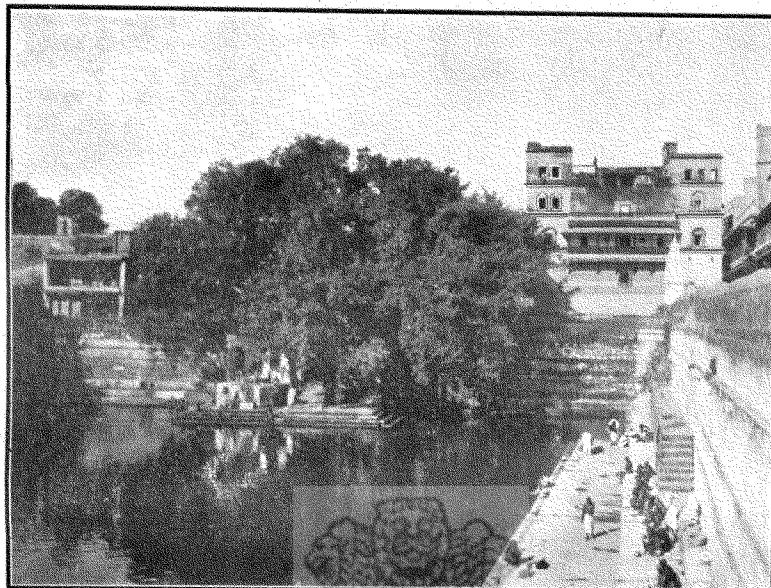


Shops along eastern wall of Jagannath's Temple. These were formerly all huts but most are now built of masonry.



On the left are huts used as shops along the north wall of Jagannath's Temple. These block up an important thoroughfare and later will probably be built of masonry.

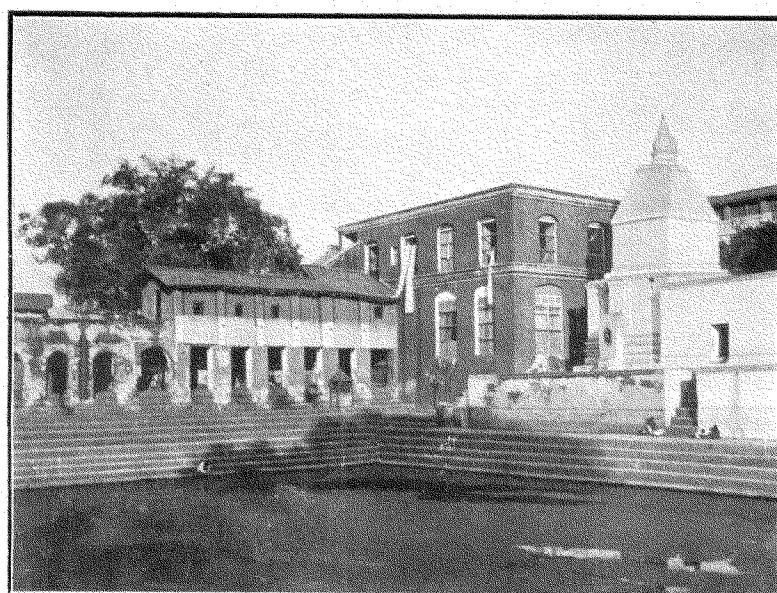
SACRED TANKS. GAYA.



A



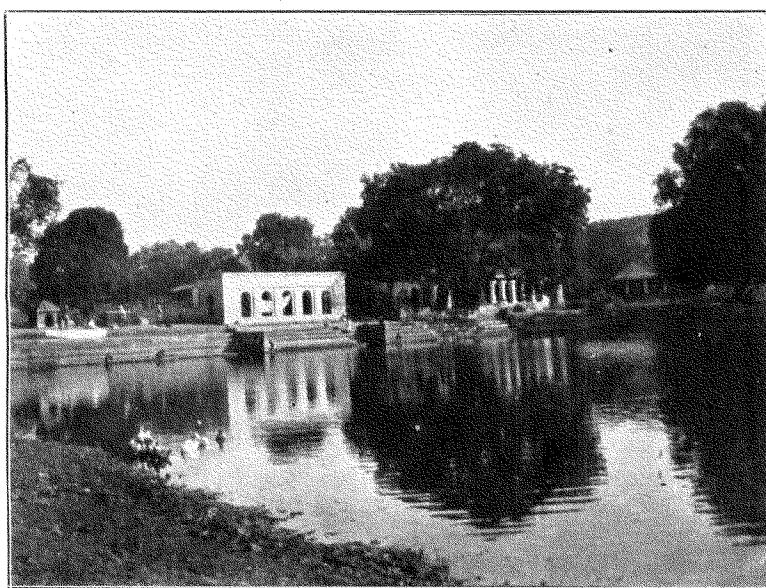
सूरज कुण्ड



B

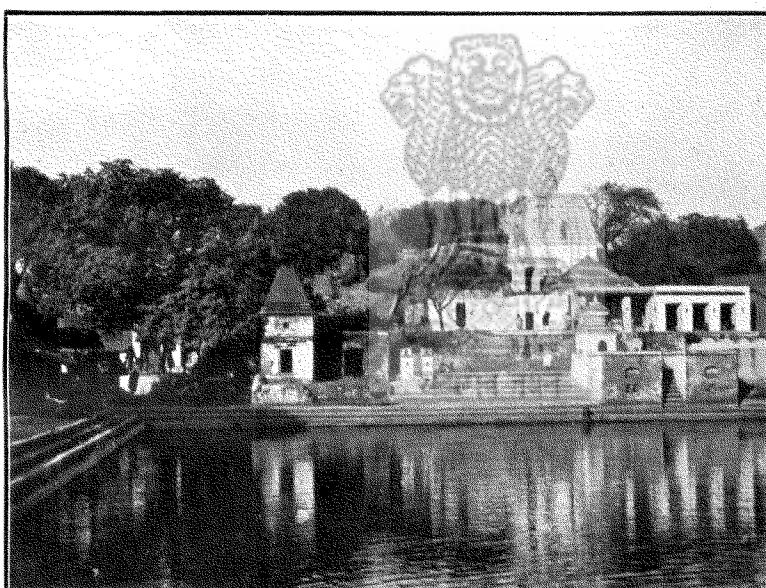
Uttarmanus Tank—The water is almost completely covered with a thick green growth of algae.

SACRED TANKS. GAYA.



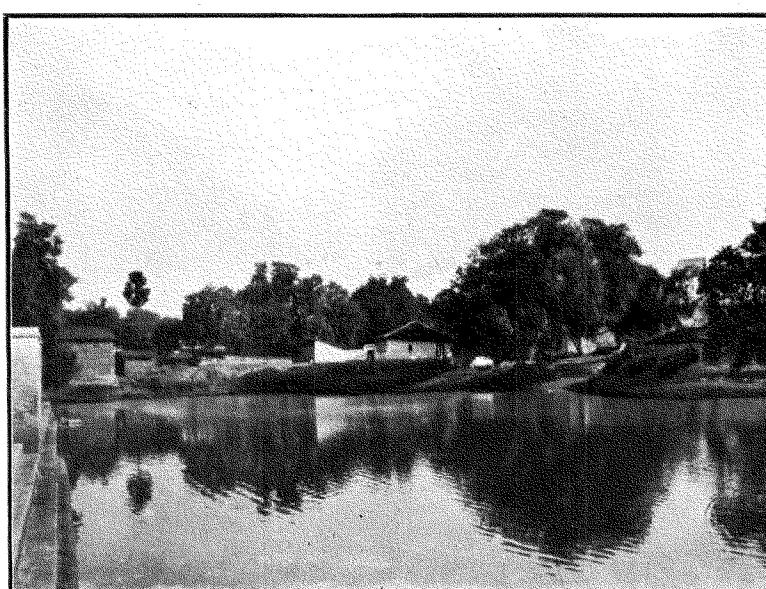
A

Brahmasat Tank—Northern end.



B

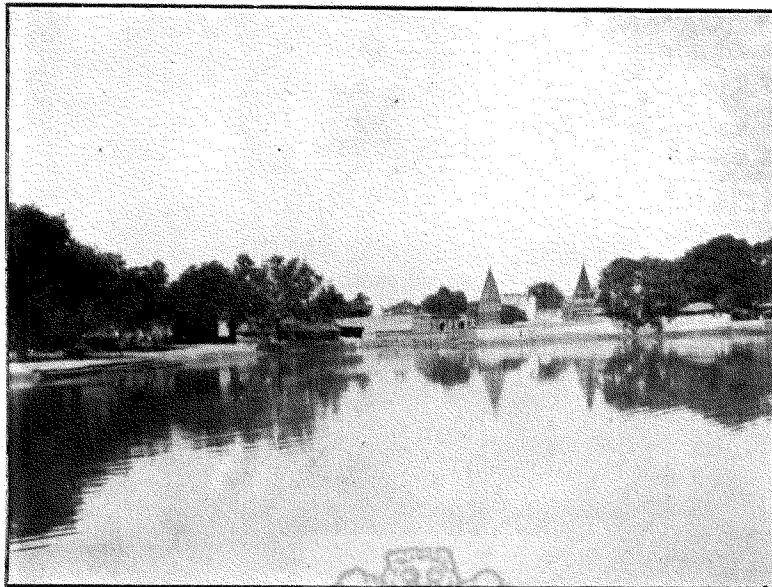
Baitarni Tank—South West corner.



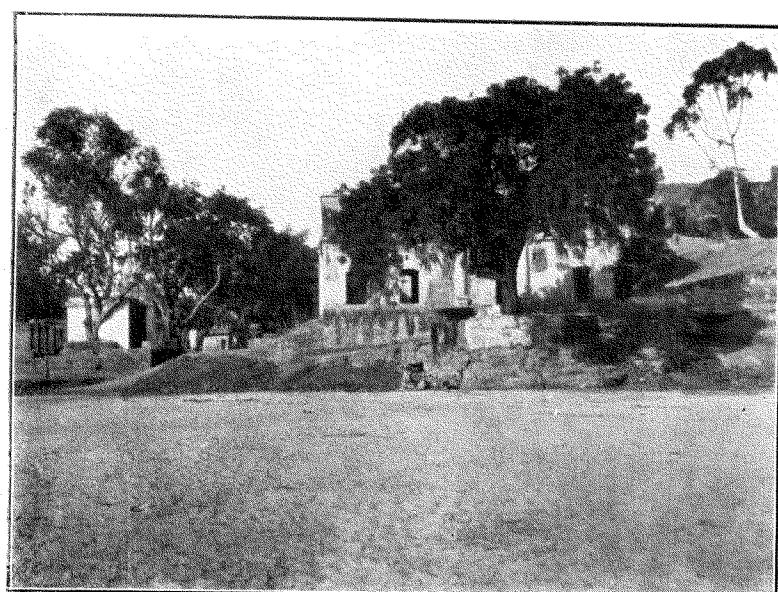
C

Baitarni Tank—Northern end.

SACRED TANKS. GAYA.

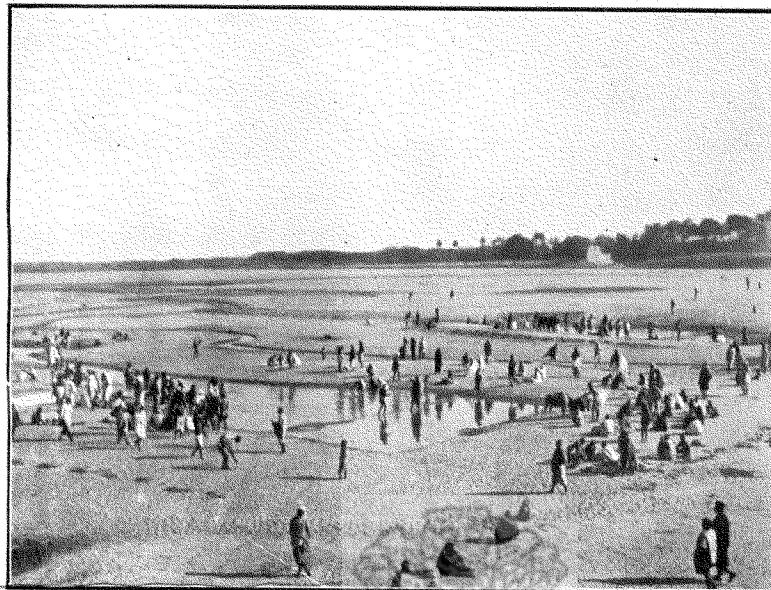


Ramsagar Tank,



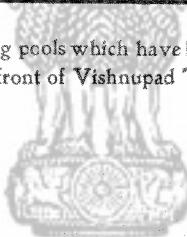
Masan Ghat with dry bed of river in foreground.

PHALGU RIVER. GAYA.



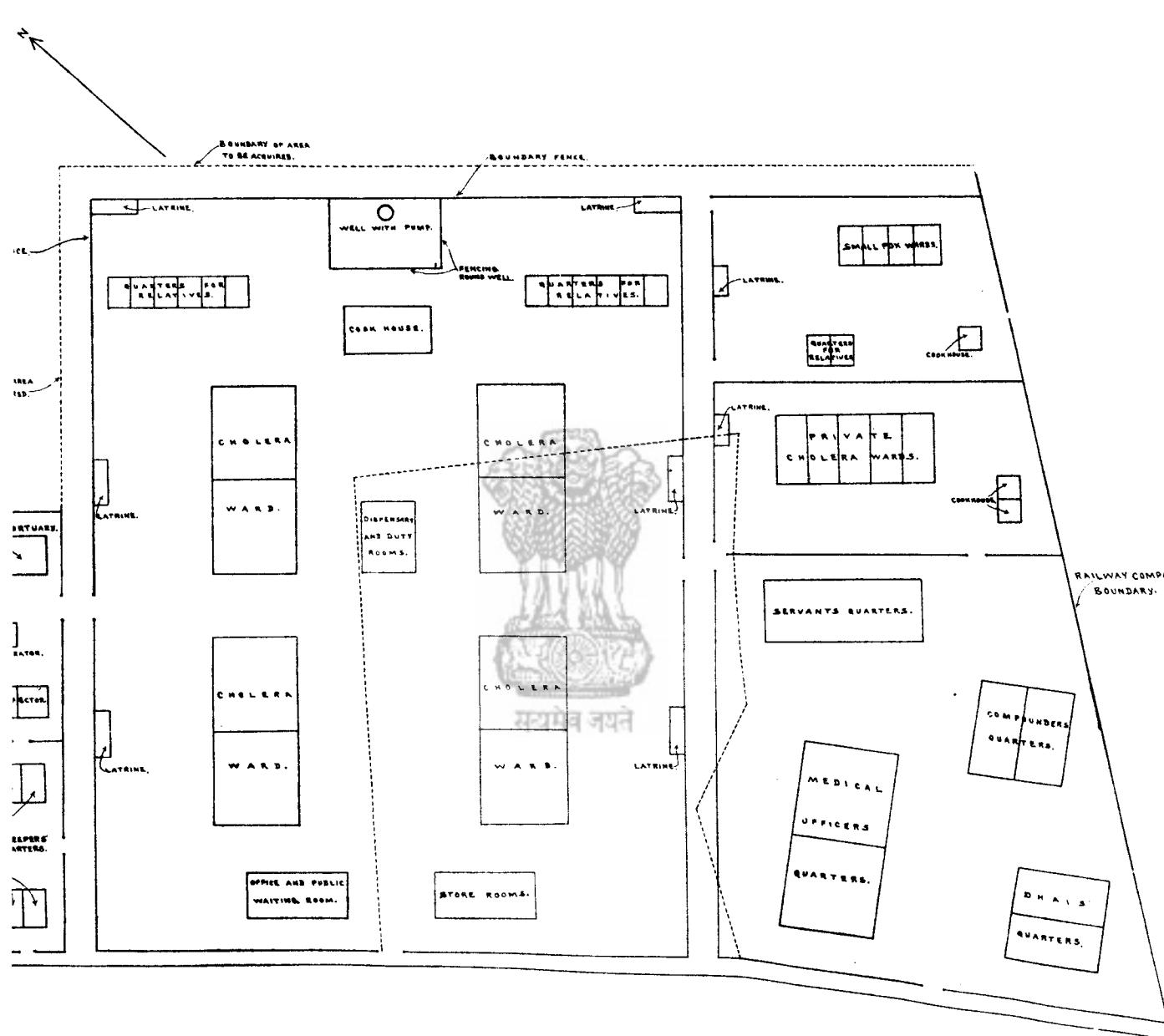
A

The bed of the Phalgu River showing pools which have been scooped out to allow pilgrims to bathe in front of Vishnupad Temple.



B

Shows shallow stream of sullage flowing along front of ghats.



**SITE PLAN
OF
PROPOSED CHOLERA HOSPITAL.
FOR PURI.**

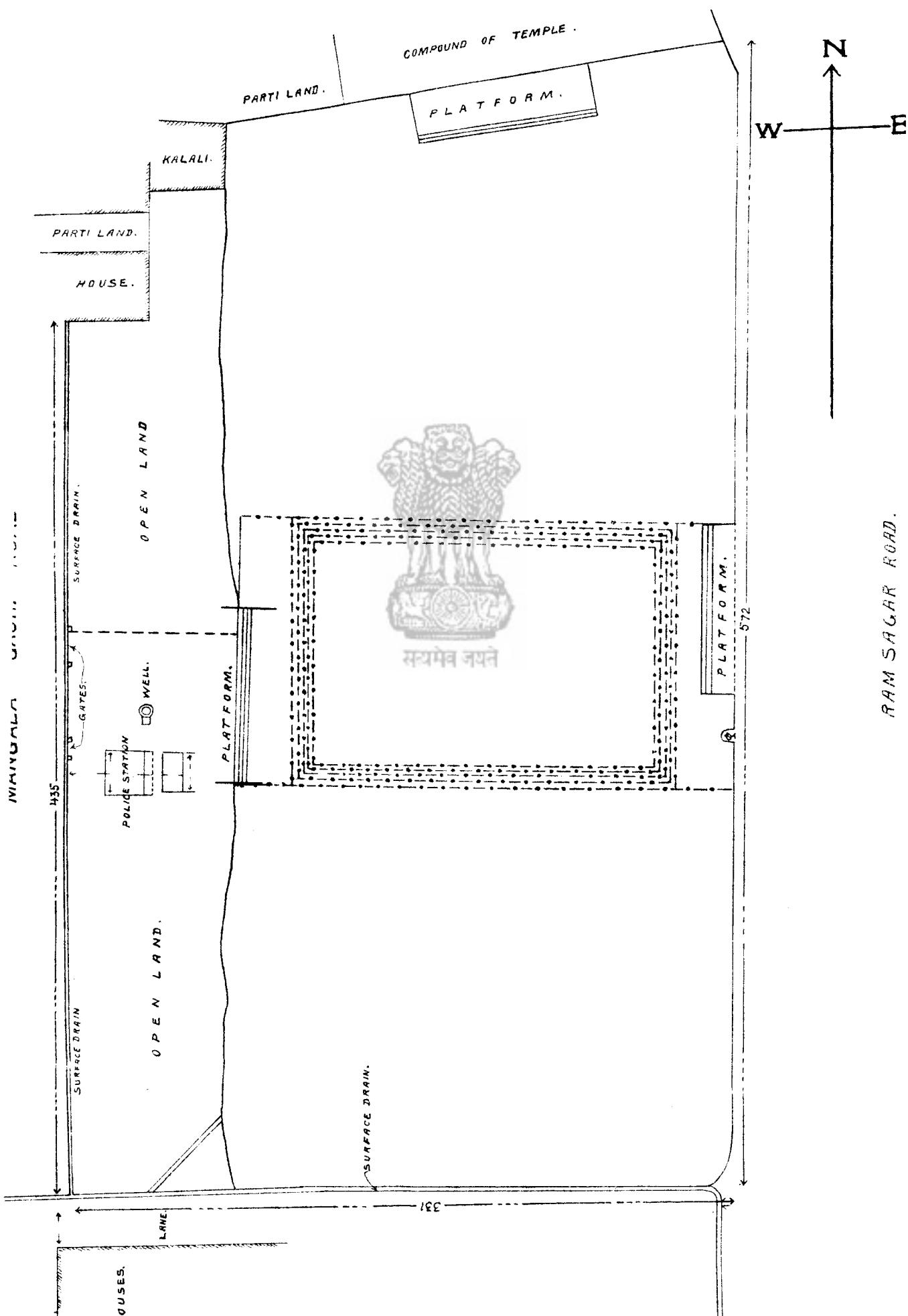
SCALE 1 INCH = 80 FEET.

AREA TO BE ACQUIRED SHOWN IN RED.

PLAN OF RAM SAGAR TANK IN GAYA

SCALE 60 1 INCH.

APPENDIX LV



MAP OF GAYA TOWN.

SCALE 1800 FEET = 1 INCH.

